ELECTRICAL SOUTH

Serving the 18 Southern and Southwestern States

Report on Tenth A-W Conference—pg. 44
Electrical South Data Sheets—pg. 64

APRIL, 1954

New!

Hunter Casement Fan

Fits all standard casement windows --with or without screens.

A BIG VALUE AT $79.95 (Retail Price)

Electrically reversible - 2 speeds

Beautiful modern design

Patented air-directing guard

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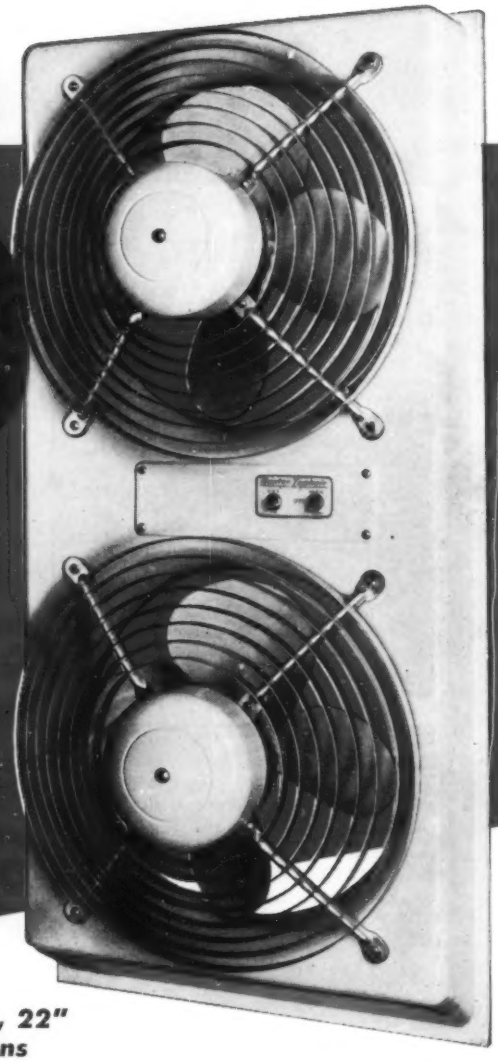

Hunter also makes 18", 22" and 30" Window Fans

Hunter Window Fans are the fastest sellers!

Hunter SINCE 1886

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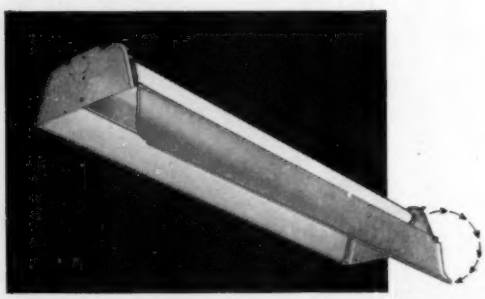
Here's the Modern Way to Light a Factory ...Using Wakefield Industrial Pacemakers



The Industrial Pacemaker is a rugged steel luminaire with all major reflecting surfaces porcelain enameled. Note that the removable side panels unhook and hinge downward for easy, safe maintenance. ETL approved, brick type ballasts deliver full rated lamp watts. For pre-heat, Rapid Start or Slimline lamps.

Note the abundance of light. Note how uniformly it is distributed. Note especially the lighted ceiling area. Only a luminaire like the Wakefield Pacemaker will give these results, for the Pacemaker transmits 25% of the light up to the ceiling to be reflected in an over-all distribution pattern all over the room.

Now note again the lighted ceiling area. Not only is this the very key to modern plant lighting, but it has the added advantage of facilitating maintenance in the upper area. Listen to what one midwestern plant superintendent says: "In parts of our plant where we use reflectors which do not allow any light to go upward, the underside of the roof and the structure beneath is black and it is impossible to see piping or other structural parts for inspection or maintenance." Those black overhead caverns in plants are out-moded, inefficient and, thanks to the Pacemaker, unnecessary. For a folder on the Industrial Pacemaker, write to *The F. W. Wakefield Brass Company, Vermilion, Ohio. In Canada, Wakefield Lighting Limited, London, Ontario.*

Wakefield Over-ALL Lighting

WAKEFIELD GEOMETRICS · THE CAVALIER · THE GRENADIER · THE PACEMAKER · THE COMMODORE · THE STAR · THE WAKEFIELD CEILING

ELECTRICAL SOUTH is published monthly at 214 West Morehead Street, Charlotte, North Carolina by W. R. C. Smith Publishing Company. Executive and Editorial Offices: 806 Peachtree Street, N. E., Atlanta 5, Georgia. Entered as second class matter at the Post Office, Charlotte, North Carolina. Subscription Rates: United States and Possessions, $1.00 per year; Canada and Foreign Countries, $10.00 per year.

Volume 34 Number 4

Engineered for the Textile Industry

3 NEW DEVELOPMENTS IN MOTOR CONTROL

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All

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- **GREATLY REDUCED FIRE HAZARD**
- **SUPERIOR PERFORMANCE and DEPENDABILITY**
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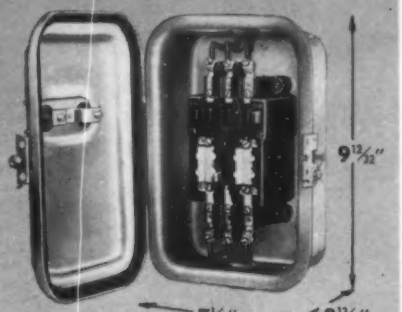
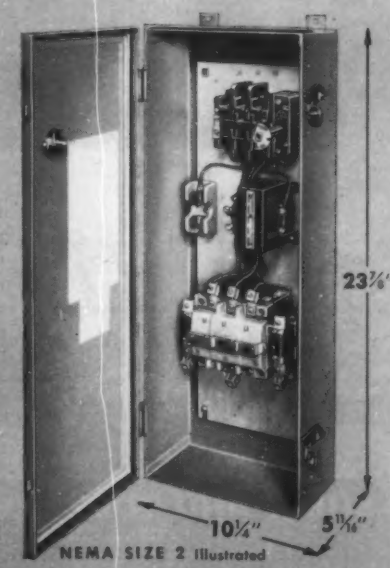
- **FASTER, EASIER INSTALLATION and MAINTENANCE**
- **SAFER, MORE CONVENIENT OPERATION**



TYPE "LM" LOOM SWITCH

NEMA SIZE 3 Illustrated



NEMA SIZE 2 Illustrated

TYPE "LM"
Loom Switch

Size 0, 3 pole, 2 hp to 600 volts a-c. Completely new, radically different . . . not just an adaptation of a standard switch. Unique, built-for-the-purpose rotary overload mechanism resists shock far in excess of any found in actual loom installations. Fully enclosed switch unit plus lint proof enclosure provides double protection against lint.

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ES-4

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ELECTRICAL SOUTH

SERVING THE 18 SOUTHERN AND SOUTHWESTERN STATES

April, 1954 — Vol. 34—No. 4

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TO HELP THE BUSY READER—

The comprehensive **report of the Tenth Annual Adequate Wiring Conference,** held recently in Chicago, is especially interesting because of the variety of viewpoints expressed by speakers representing manufacturers, utilities, contractors, and others. **See page 44.**

Planning and installing electrical equipment of unusual scope and complexity confronted engineers and contractors who were charged with putting into operation an **electrical system for medical research.** **See page 34.**

What happens to the electrical contractor or subcontractor when the building in which he is installing wiring or equipment is destroyed by fire or storm before the job is completed? Every contractor should understand his **legal rights on incomplete jobs.** **See page 39.**

The 1953 National Electrical Code states quite definitely the requirements for **wiring the equipment for a gasoline dispensing station.** Because of the many ideas, opinions, and criticisms expressed at meetings held to discuss the 1953 Code revisions, B. Z. Segall, consulting engineer, discusses the subject in a two part article, beginning **on page 42.**

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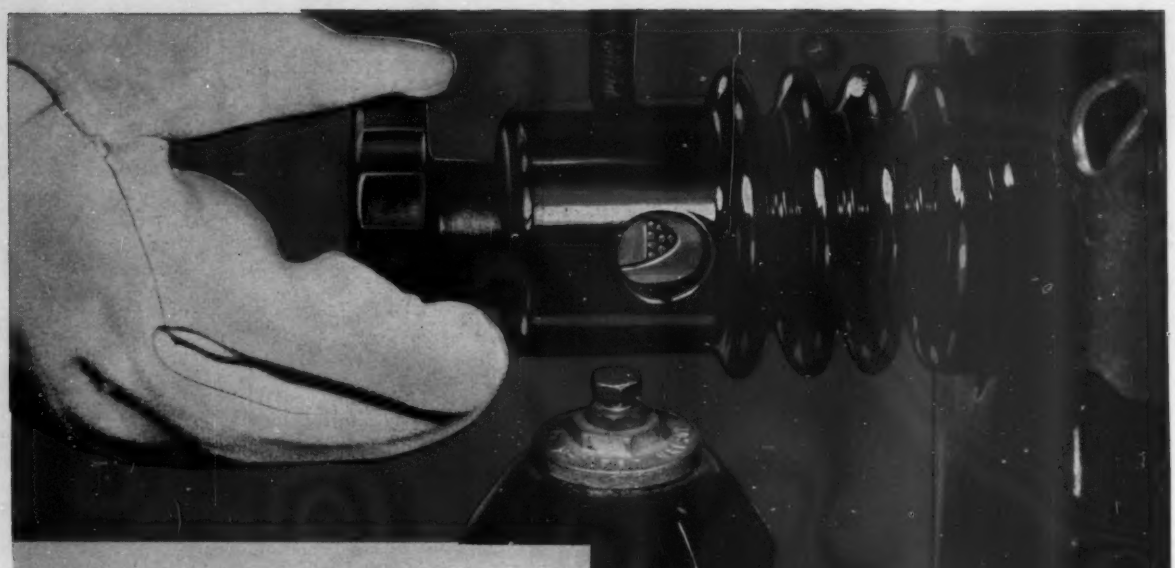

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TURN the clamping knob on Allis-Chalmers new high voltage sidewall bushings to complete installation connections. It grips two standard conductors as large as No. 2 stranded cable at the same time. It eliminates splicing. Connections can be made from either side of the bushing quickly, without tools. Careful engineering provides complete protection against live parts.

The new sidewall bushing is supplied on Allis-Chalmers distribution transformers 167 kva and smaller, 5 kv and below. Get complete facts from your nearby Allis-Chalmers authorized dealer or district office, or write Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin. A-4305

FEATURES

1 Large molded phenolic clamping knob with finger-grips facilitates turning. It will not fall off, even when completely backed-off. Knob collar keeps fingers away from live parts.

2 Convex surfaced ram, actuated by knob, forces wires against the concave surface of connector body. This snubbing action locks the cable in the connector. All parts are tinned.

3 Integral bushing electrode simplifies lightning arrester installation on transformers. Gap from bushing to lightning arrester terminal removes electrical stress from the arrester except when flashover occurs.

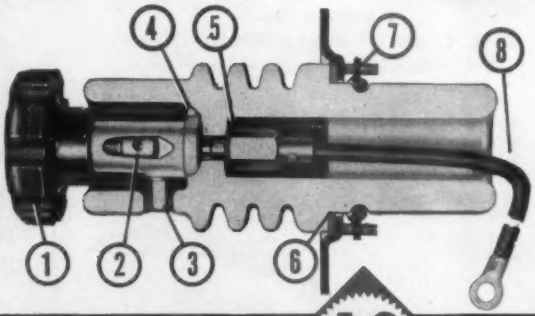
4 Connector is keyed to porcelain preventing rotation, thus protecting the gasket against twist or shear. Gasket prevents oil leakage.

5 Fibre gasket provides mechanical cushion between metal parts and porcelain.

6 Bushing is sealed in tank wall with corprene gasket. Recessed seat retains gasket for effective seal.

7 Internal clamping ring keeps bushing locked securely in place. Bolts exert even pressure on tank wall to produce uniform gasket compression. Internal ring helps simplify external maintenance.

8 Bushing cable terminates at terminal board. Easy removal simplifies routine maintenance.



A-C ALLIS-CHALMERS

ALLIS-CHALMERS

Economic comment

by J. Whitney Bunting, Ph.D.

Manpower—a critical asset

Manpower, claimed to be one of America's greatest resources, could be one of her greatest problems as well in an all-out emergency. Our dynamic economic system has been blessed, in peacetime, with a vast army of workers with productivity greater than that found anywhere else in the world. North, south, east, or west—American labor develops high skills and truly magnificent output. It is one feature of our military potential that Russia and all of her satellites cannot match, and probably never will.

Yet this vast human talent must be perpetuated and in fact must be made truly mobile for all-out military and defense production if such a need arises in the near future. During the last two World Wars when America served as the "Arsenal of Democracy," we were blessed with good fortune, for, even though there was much waste in the use of manpower, we were able to rise up and out-produce our enemies. Will we (or can we) achieve the same degree of productive success if another, and vaster, conflict should come upon this nation?

Manpower inventory needed

Modern warfare is becoming more and more a conflict of production and ideologies. It is certainly true that the present status of history combines the two, more so than at any time in the past. Thus, it is necessary for America to bring together all of her productive potential, whether it be management, machines or manpower, in order to outlast any assumed enemy. Industry constantly inventories management and tries, at least, to maintain a steady flow of such talent into the business system. Executives are constantly fed out to all types of educational programs for a review of modern management techniques and practices. Colleges are training more and more young men and women for positions of importance and responsibility in the business machine. And as we can observe this trend, the anticipation is for a continuance of supply of managerial material for some time to come.

On the other hand, it is fairly simple for industry to catalog or inventory supplies of materials and machines for industrial production. All manner of scientific control measures are taken to insure proper data for evaluation of the production potential. It would be poor management that would do otherwise. Further, great sums are expended annually for research and development so that American tools and machinery will be of the best for both peace and war production. Such efforts have enabled this nation to continue to offer a standard of living to the people better and higher than anywhere else on the face of the globe. Such constant pressure for the newest of productive devices makes for a veritable powerhouse of productive equipment when the need arises.

Manpower, on the other hand, is an entirely different thing. True, American policies of labor-management relations are good and constantly improving. Much time and effort is devoted by business leaders to the problem of the human element in the economic operation. But manpower control is far greater than plant libraries and cafeterias, rest periods and recreational programs, and all of the other techniques of good management practice so well-known today.

Skilled trades replenishment

There needs to be much greater advance in the principles of development of greater and more abundant skills so that our ever-aging population will be able to retire with a steady flow of new talent coming upon the scene. The skilled trades seem not to be as popular as they once were and more young people want to get on management's team rather than be a part of a vast operations force. It could be a case of too many generals and not enough non-commissioned officers and privates. Industry has not made the work of skilled labor interesting enough for young men and women. Labor unions, too, have impeded this movement because of policies of seniority and restrictive membership and the like.

But even more significant is the lack of inventory of available skilled talent that faces us today. In the event of hostilities, the armed services know immediately the skills and talents of those on their rolls, whether presently or in the past in the armed services. These records and files are kept up to date insofar as possible. Skilled transportation men can be called up for service with a minimum of delay and will be available for almost any duty in keeping with their abilities.

But the industrial labor force is not so cataloged, and, as a result, cannot be used most effectively and efficiently when the need arises. Manpower is a human resource and not a machine to be inventoried in the fashion of parts or replacement items. But manpower does, and must, serve as a contributing part of the economic potential for defense or for war. Thus talent inventories of all people should be taken by a government agency at five year intervals so that a centralized control may be maintained in readiness for emergency action. There is little doubt but that any future war or defense action will spell emergency. The efficient use of industrial manpower might truly mean the hope of existence for the American Way of Life.

January labor decline

A heartening economic indicator to southern businessmen is the fact that although industrial employment in the nation dropped considerably in January, the southern area did not fare too badly. In fact, the rate of decline was far less in the South than elsewhere in the

(*Continued on page* 94)

Dr. Bunting, well-known southern economist, is president of Oglethorpe University, Oglethorpe, Ga.

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ACCURATE is the choice for every electrical application. For regular wiring or heavy duty insulation, **ACCURATE** Standard and Specification Grades exceed required standards. Made of the finest raw materials, carefully compounded by tape specialists, every foot of Accurate Tape is inspected and tested by methods proved by experience gained in 30 years of tape manufacture. Specify **ACCURATE** for positive electrical and mechanical protection.

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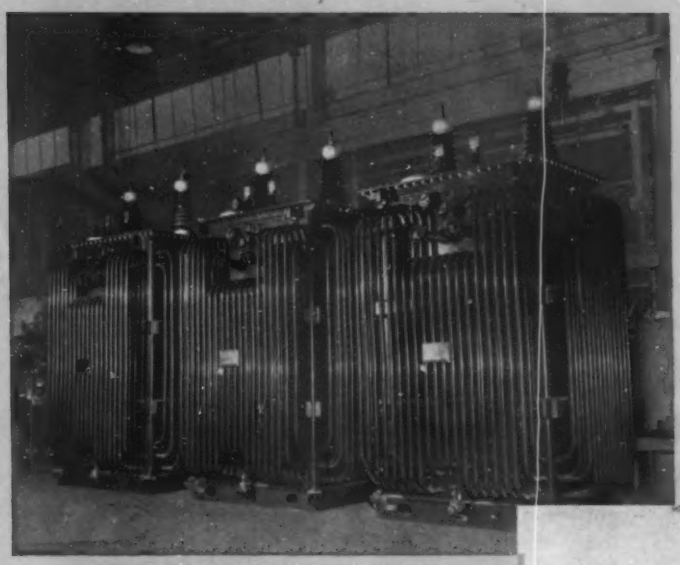
KUHLMAN—the first nationally known transformer manufacturer with a plant in the South . . . to serve the South!

Established in 1952 to manufacture transformers in the South — for the industrial needs of the South — Kuhlman's Southern Division at Crystal Springs, Mississippi, is located close to the center of the great Southern market. With offices and warehouses in principal cities throughout the South, Kuhlman is well situated to serve Southern utilities and industry.



This big, modern plant of Kuhlman Electric Company at Crystal Springs is completely equipped to build dependable transformers that will provide a steady source of power for Southern utility and industrial customers. From here, transformers can be shipped directly to any part of the South.

These three 2500-KVA, Single Phase, 69000-volt primary Kuhlman Power Transformers were built at Kuhlman's Southern factory. Kuhlman also builds Distribution, Dry Type, Subway, Saf-T-Kuhl, CSP and Series Street Lighting Transformers. For complete information, write today.

KUHLMAN

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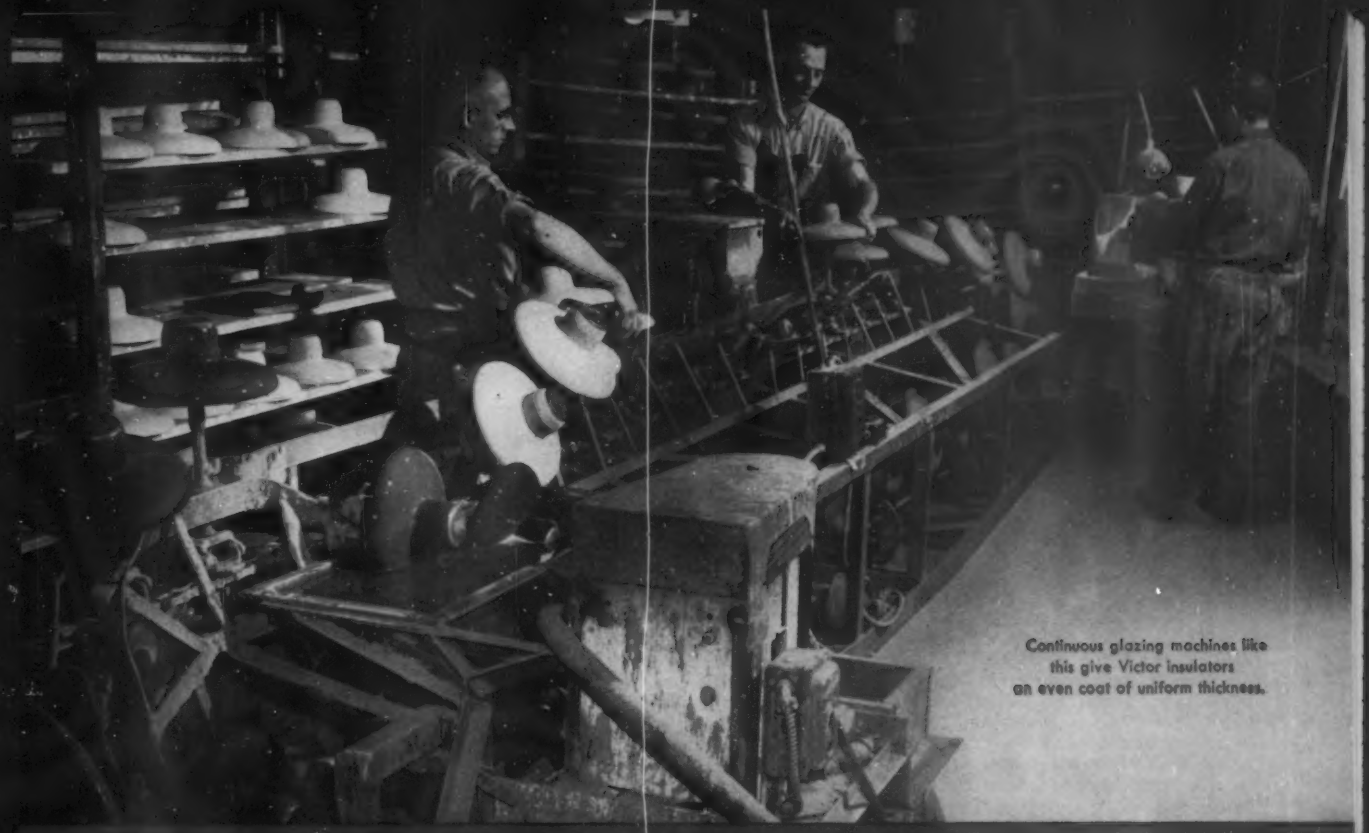

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CATALOGS and BULLETINS

Available Free to Readers of Electrical South upon Request

1008—Motor Starters

A new bulletin, Number 514-515, has been issued by the Industrial Controls Division of Federal Electric Products Co., 1429 Park St., Hartford 6, Conn. Describing in detail the company's line of combination motor starters, the booklet is copiously illustrated with photos of the various types available and includes detail drawings of special features.

1030—Lighting Catalog

An eight-page descriptive bulletin issued by Pittsburgh Reflector Co., 450 Oliver Bldg., Pittsburgh 22, Pa., describes in detail the most popular items in the Pittsburgh line of fluorescent and incandescent lighting equipment. Each item is fully illustrated and cataloged and many are accompanied by installation plans.

1032—Receptacles and Plugs

Russell & Stoll Co., Inc., 125 Barclay St., New York, N. Y., has released a bulletin, No. EL-4-46, describing the new Ever-Lok receptacles, plugs and cord connections for 30 amperes, 440 volts, a-c. Typical uses are for heavy duty industrial purposes.

1048—Plug-In Strip

An illustrated catalog showing the complete "Plug-in" Strip line has recently been pulblished by National Electric Products Corp., Pittsburgh, Pa. This eight-page illustrated brochure pictures the three and six foot standard lengths of the multi-outlet branch circuit assembly.

1054—Fluorescent Fixtures

Catalog No. 53 illustrates 74 pages of commercial and industrial designs. Featuring all types suitable for schools, industrial and commercial buildings, retail stores, etc. This catalog is available from the Kayline Co., 2480 E. 22nd St., Cleveland 15, Ohio.

1058—Conductor Fittings

A complete catalog, illustrated and listing prices, has been issued by Penn-Union Electric Corp., Erie, Pa. Described is the company's complete line, including a wide variety of service connectors, terminals, tees, and taps; also many other types of conductor fittings.

1076—Modular Lighting

A 20-page booklet containing interesting and useful information about the "modular system" of lighting can be obtained by writing to the Mitchell Manufacturing Co., 2525 Clybourn Ave., Chicago 14, Ill.

1082—Lighting Equipment

Preprints of the F. W. Wakefield Brass Co.'s eight-page section on lighting which will appear in the 1954 Sweet's Catalog are available on request to Wakefield, Vermilion, Ohio. Included are descriptions of 11 major types of lighting equipment.

1086—Cable Connectors

Tomic Sales and Engineering Co., 4864 Woodward Ave., Detroit 1, Mich., now have available catalog sheets containing data on the complete line of their connectors, couplings, and cable connectors.

1088—Fittings and Fixtures

A 32-page illustrated catalog covering Killark fittings and fixtures is offered by Killark Electric Mfg. Co., Vandeventer and Easton Aves., St. Louis 13, Mo.

1090—Midget-Size Busduct

Complete information on Power Plugin, the new, midget-size busduct, is found in bulletin No. 720, available from Frank Adam Electric Co., 3650 Windsor Pl., St. Louis 13, Mo.

1092—Electrical Boxes

Steel City Electric Co., 1207 Columbus Ave., Pittsburgh 12, Pa., offers a catalog of their complete line.

1110—Aluminum Cables

A new 16-page booklet, OK-1070, published by the Okonite Co., Passaic, N. J., contains the latest information on insulated aluminum power cables. It is based on two AIEE papers and reviews the properties, problems and advantages.

1130—Conduit Fittings

The latest completely illustrative catalog on their diversified line of conduit fittings is announced by the Atlantic Conduit Fittings Co., 589 Atlantic Ave., Boston 10, Mass.

1136—Space Heating Guide

Cavalier Corp., Chattanooga 2, Tenn., has prepared a Guide for Cal-

ELECTRICAL SOUTH
806 Peachtree St., NE
Atlanta 5, Ga.

April, 1954

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1090	1092	1110	1130	1136
1144	1150	1156	1166	1172
1178	1182	1184	1186	1188
1190	1192	1198	1200	1202
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50 Years

May 11, 1954

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DESIGNED TO

Do Better Jobs Quicker

Starting with the manufacture of limited lines of locknuts, brass bushings and cast iron floor boxes in 800 square feet in a building on Pittsburgh's famous "Point," Steel City has developed lines of electrical boxes and conduit fittings now taxing manufacturing facilities occupying more than 148,000 square feet of space in Pittsburgh's North Side. Facilities for production of Steel City-Kindorf Conduit Hangers and Supports are steadily requiring more space than is provided in Oakland, California, making necessary enlarging the Pittsburgh plant.

This growth has been due to these important facts—

(1) A thorough knowledge of the requirements of the items manufactured. (2) Designing such items for ease and time-saving installation. (3) The use of the best available material for their purpose. (4) Rigid inspection along production lines and before shipping to assure against loss of time caused by defective items reaching the job.

Better Jobs Quicker are assured when you specify or use the products of—

Pittsburgh's famous "Point" where the Allegheny and the Monongahela merge to form the Ohio River. This was the site of the building in which Steel City started business fifty years ago. It and many other buildings were razed for development of Pittsburgh's "Gateway to the West."

STEEL CITY ELECTRIC CO.

PITTSBURGH 25 PENNSYLVANIA

ELECTRICAL BOXES AND CONDUIT FITTINGS

KINDORF DEVICES FOR INSTALLING CONDUIT

OUR 50th YEAR

NEW-special-industry enclosure!

Patterned after Joint Industrial Control requirements

New I-T-E particle-proof enclosure assures dependable circuit breaker operation in all dust-laden atmospheres:

EXTERNAL MOUNTING FEET
Readily accessible, for easy surface mounting.

DUST-TIGHT ENCLOSURE
Solid sheet-steel sides and back with closed welded seams. No holes—no knockouts. Attractive bonderized finish.

EXTERNAL OPERATING HANDLE
New molded handle operates circuit breaker from outside enclosure. Plate indicates position of breaker handle at all times. Handle may be padlocked in either "ON" or "OFF" position. Defeater arrangement allows authorized personnel to open cover with breaker "ON."

DOUBLE-LOCKING COVER ARRANGEMENT

FELT COVER-GASKET
Recessed and held in place by metal retaining strips. Assures tight seal when cover is shut.

DEPENDABLE I-T-E MOLDED CASE CIRCUIT BREAKER
Thermal-magnetic. Provides positive protection against short circuits and overcurrents. Quick-make, quick-break, trip-free. Assures quick restoration of service without replacement of elements. I-T-E quality design and construction.

AVAILABLE NOW
with I-T-E "E" frame, "F" frame, "J" frame, and "L" frame circuit breakers—in ratings from:
15-600 amperes
125-600 volts a-c
125-250 volts d-c

SEE YOUR LOCAL I-T-E REPRESENTATIVE OR DISTRIBUTOR
or write to *I-T-E Circuit Breaker Co., 19th and Hamilton Sts., Phila. 30, Pa.*

I-T-E

MOLDED CASE CIRCUIT BREAKERS

culations of Electric Space Heating. It is based on study of several thousand installations of electric heat and is a handy reference for calculating electric heating requirements and estimating operating costs. The booklet contains discussion, charts, and floor plan examples.

1144—Lighting Fixtures

Catalog available from Lithonia Lighting Products Co., Lithonia, Ga., contains descriptive literature, specification sheets and photo-metric data on their complete line of fluorescent lighting equipment for commercial, industrial, school and other applications.

1150—Fluorescent Fixtures

Colorful, 20-page catalog. Front cover shows interesting illustration of "Light through the Ages." Catalog gives complete specifications and pictures of entire Naturlite line manufactured by Light & Power Utilities Corp., 1035 Firestone Blvd., Memphis, Tenn.

1156—Industrial Lighting

The new Abolite Catalog and Handbook contains a complete descriptive story of all commercial, industrial floodlighting equipment manufactured by Jones Metal Products, Inc., West Lafayette, Ohio.

1166—Electrical Fittings

A 40-page illustrated catalog and price list on the Gedney line. Shown and listed are conduit, threaded entrance, SEC, EMT and ground fittings, and box connectors for both armored and non-metallic cable. Copies are available from Gedney Electric Co., RKO Bldg., Radio City, New York 20, N. Y.

1172—Busduct Manual

A 68-page manual, Bulletin No. B-4272A, describing types of busduct and accessories available, and presenting application and test data, specifications, and information on pricing a typical busduct installation is available from Westinghouse Electric Corp., Box 2099, Pittsburgh, Pa.

1178—Remote-Control Wiring

Bulletin 16-200 is a 36-page manual describing layout and installation of remote-control wiring, and is available from General Electric Co., Construction Materials Dept., Bridgeport 2, Conn. Advantages and explanation of the system are followed by illustrated installation procedure.

1182—Switch Insulators

A new bulletin giving specifications, engineering data, contours, dimensions, etc. on its full line of Switch and Bus Insulators has been recently published by Victor Insulators, Inc., Victor, N. Y. Write for Bulletin No. 5 or use reply coupon.

1184—Approved RHW Wire

Bulletin No. 1018 describing first Underwriters' Approved Type RHW Wire, developed to meet the new National Electrical Code standards, is available from Simplex Wire and Cable Co., 79 Sidney St., Cambridge 39, Mass.

1186—Electric Heating File

This file offered by Electromode Corp., 45 Crouch St., Rochester 3, N. Y., is made up to suit individual requests for information on Electromode Heaters for domestic, industrial or farm use; or to contain material on the complete Electromode line if desired.

1188—Dry-Type Transformer

An eight-page illustrated booklet on the Type E, totally-enclosed, nonventilated dry-type transformer is available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Made in ratings from three to 50 kva, the transformer provides greater economy for plant distribution systems where dirt, lint, and non-explosive dust are a problem.

1190—Electrical Fittings

Blackhawk Industries, Dubuque, Iowa, offer a new two-color bulletin describing and illustrating B-I Electrical Fittings and Fixtures. Included are conduit and cable fittings, conduit and cable straps, staples, box supports, sill plates, locknuts and bushings, wire holders and yard lights.

1192—Wire Pulling Lubricant

Illustrated six-page folder showing the advantages of an improved Y-Er Eas wire pulling lubricant is available from Electro Compound Co., 3812 150th St., Cleveland 11, Ohio.

1198—Wire Handling Devices

Clyde W. Lint, 2323 W. 18th St., Chicago 8, Ill., manufacturers of the Jiffy Line of wiring handling devices, has issued a three-page catalog insert of descriptions and price schedules for the materials in the Jiffy Line.

1200—Fluorescent Fixtures

Complete information on commercial fluorescent and incandescent lighting of all types, for offices, schools, libraries, etc., and all industrial locations available from Benjamin Electric Manufacturing Co., Leader Div., Northwest Highway, Des Plaines, Ill.

1202—Code Explanation

Bulletin 2660 contains up-to-date information (following 1953 Code revision) on why equipment for hazardous locations is designed and built as it is, and is available from Crouse-Hinds Co., Wolf & 7th, No., Syracuse 1, N. Y.

1204—Conduit Fittings

Illustrated Catalog available upon request to Electrical Fittings Corp., Woodside, N. Y., or their nearest warehouse in your locality contains complete information on the company's electrical conduit fittings, conduit nipples, couplings, and elbows.

1208—Contemporary Lighting

Two brochures describing contemporary lighting fixtures for residential, commercial and display purposes. Included are sizes, types, framing-in details, illustrations. Prescolite Mfg. Corp., 2229 Fourth St., Berkeley 10, Calif.

1214—General Catalog

General catalog of Royal Electric Co., Inc., Pawtucket, R. I., covering flexible service and lamp cords, cord sets, extensions, trouble lights, wiring devices and decorative Christmas lighting is available to wholesalers. Dealer catalogs may be secured from Royal distributors.

1218—Carbon Products

A 28-page catalog on Motor and Generator Brushes and carbon products telling how to order brushes, grade recommendations, characteristics and description of brush grades is available from the Helwig Co., 2536 North 30th St., Milwaukee, Wis.

1220—Stadium Lighting

The Pyle-National Co., 1334 N. Kostner Ave., Chicago, Ill., announces the availability of a new eight-page bulletin, No. 605, on stadium lighting, describing in detail floodlighting of a typical outdoor athletic arena stressing the importance of using fully enclosed floodlights.

1222—Carbon Lamps

Nalco Candylbeme decorative carbon lamps are the subject of a new leaflet which is now available from North American Electric Lamp Co., 1014 Tyler St., St. Louis, Mo. Descriptions, specifications, and list prices are given for the lamps.

1224—Electrical Equipment

The Wadsworth Electric Mfg. Co., Inc., Covington, Ky., has issued a new catalog Con 15-0 and Bulletin W. C. B. 53-1, containing data on their lines of Safety Switches, Service Equipment, Distribution Panels and "E-Z-RED" Circuit Breakers.

1228—Time Controls

A revised and enlarged edition of the booklet "How Time Controls Save Work, Time and Money on the Farm" has been announced by the Paragon Electric Co., Two Rivers, Wis. The revised edition includes new time control applications devoted to showing farmers how to earn more money by actually doing less work.

1230—Hot Line Repairs

Twenty time-saving techniques for making hot line repairs and replacements are detailed in a new 72-page, spiral-bound, pocket-size book for on-the-job use. Included are useful charts giving the characteristics of all bare conductors. Copies are available from James R. Kearney Corp., Dept. HF, 4236 Clayton Ave., St. Louis 10, Mo.

LOCKED IN PERFECT ALIGNMENT

Uni-Race sections slide into a firm telescopic union with coupler forming a rigid channel that will not distort (even before screws are added) and assures perfect fixture alignment.

THE NEW

ortho-77

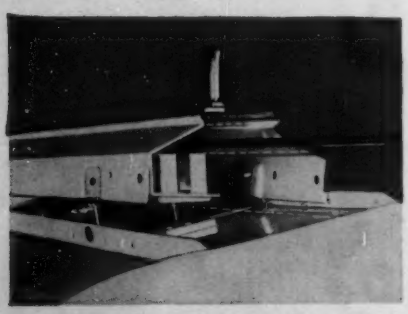
Reg. U. S. Pat. Off. Applied For

WITH UNI-RACE

Acclaimed by lighting experts everywhere as "ushering in a new era in fluorescent fixture design"; the spectacular new Ortho-77 by Gibson is an entirely new concept of fixture design. Incorporated for the first time on any fluorescent fixture are a multitude of features that simplify installation, provide position alignment and spacing and give greater fixture rigidity. Now without tools and in a matter of minutes you can change fixtures instead of ballasts . . . raise lighting levels from two to four light or vary the levels as conditions demand . . . install fixtures at intervals automatically spaced and fill in quickly and easily as needed. Contractors have claimed as much as 50% saving in installation time with the Ortho-77 which means that you, the user, can install this revolutionary fixture incorporating the new Uni-Race, "V" type integrated construction, simplified plug-in wiring and many other features at no greater cost than a conventional installation. See it at your jobber today or write for bulletin Ort-101 for complete information.

RIGID CHANNEL ANCHOR

Light in weight, readily accessible and easily mounted, the Uni-Race provides a rigid channel anchor for all Ortho-77 models. Being machined to exceptional tolerances, it automatically provides for exact fixture spacing.



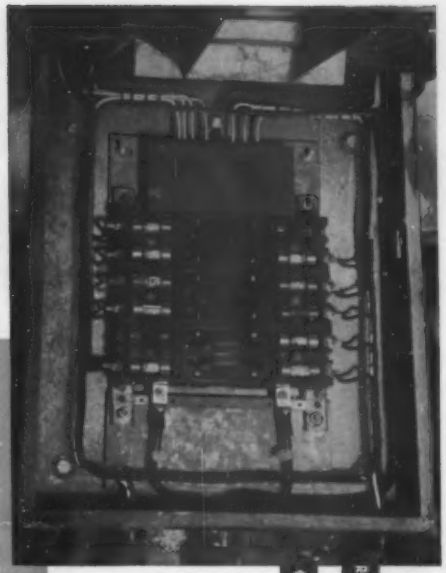
PLUG-IN SOCKET

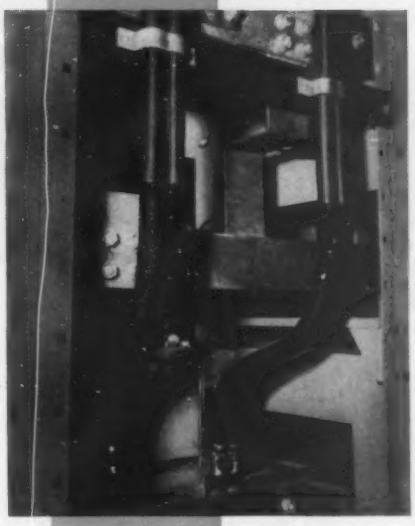
Ortho-77 units are wired to a Plug-In Socket which makes contact with a receptacle in the Uni-Race when fixture is closed. Fixture becomes completely dead when open, and being wired in parallel circuits, does not disturb other fixtures when removed.

GIBSON Manufacturing Co.

1919 Piedmont Circle, N.E. **Atlanta, Georgia**

How a Texas chemical company solved a tough cable requirement





High ambient temperatures, together with corrosive fumes from acids and caustics, may cause cables to disintegrate within a few months... unless you've specified the correct insulation.

That is one of the reasons why a large Texas chemical company specified Rome Synthinol® 901 insulated wire and cable for plant wiring. This special compounded polyvinyl chloride insulation provides *exceptional resistance* to acids, oils, corrosive fumes, greases, moisture, and heat deformation for most applications through 600 volts.

Its performance has been so good that it is now one of the most frequently specified cable insulations for chemical plants, oil refineries, paper mills, steel mills and similar industrial plants. Ask your purchasing department to check this.

You will save time and money on the installation of Rome Synthinol 901. It is uniform in diameter and easy to pull. Permanent color coding helps to identify circuits quickly.

Rome Synthinol 901 Insulated Wire Approvals

Appliance Lead Wire—Underwriters approved for 600 v. at 90°C. through size No. 4/0 AWG. Approved for 105°C. on smaller sizes No. 24 through No. 16 AWG.

Type TW—Underwriters approved as Type TW for 60°C. operation, under the National Electric Code. High resistance to heat means greater safety factor at elevated temperatures.

Machine Tool and Control Wire—Underwriters approved as Type TW, with end use approval for 90°C. operation in air; 60°C. where exposed to oil and in wet locations. Conforms with National Machine Tool Builders' Association standards. Resistant to extreme ambient temperatures, acids, oils, cutting solvents and flame.

It Costs Less to Buy the Best

ROME CABLE
Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

ROME CABLE CORPORATION, Dept. ES-4, Rome, N. Y.
Please send information on Rome Synthinol and Rome Synthinol 901

Name.....

Company.....

Address.....

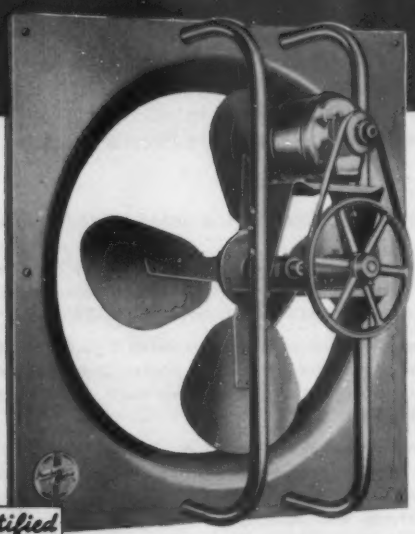
City..... Zone..... State.....

When you handle Peerless Exhaust Fans you make profit on the original installation . . . next, you have fewer call backs than with any similar makes . . . it amounts to two-way profits for you. Remember, too, Ventilattic Fans are part of Peerless' middle-size job plan. This means factory-to-you contact for engineering and delivery information.

Peerless Electric Ventilattic Exhaust Fans cost less to install—less to maintain. The secret's in rugged construction—careful design—motors and fans built and matched by one manufacturer.

Each unit is completely welded together—slips into place quickly—fastens securely with a half-dozen screws. Peerless Ventilattic Fans are belt-driven at slow speed for the ultimate in quiet, efficient operation. They are guaranteed!

If you have a job on the fire now, write, call, or wire Peerless.



Certified Ratings CR PFMA

TYPE PAT—An attic type fan recommended for night cooling of homes, stores and clubs. Type PAT moves from 5,000 to 20,000 cubic feet of air per minute. Quiet, efficient operation stamps it a "Peerless Product."

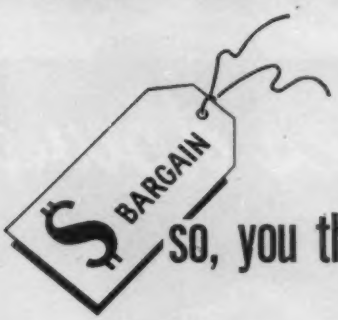
"SMOOTHEST PERFORMERS ON THE MARKET"

Peerless Electric

FAN AND BLOWER DIVISION

THE PEERLESS ELECTRIC COMPANY

1421 WEST MARKET STREET WARREN, OHIO



so, you think you're saving your customer's money?

Far too often people figure lighting fixtures are all alike and buy and sell by price tag alone. You may save your customers a dollar or two on the price of each unit, but are you really saving their money?

Today's carefully engineered lighting installations are planned with units that are designed to deliver more light at less cost. *Fewer units are required to secure the same results.* So, installation costs are less. And most important, power and maintenance costs are less during the whole life of the installation.

Take the Smithcraft DIRECTOR, for example. A recent comparison test by one of the nation's leading electric utilities clearly demonstrates that the Director produces more light and better light per dollar spent than ordinary fixtures.

Installed in literally thousands of banks, stores, schools and similar locations across the United States, the Smithcraft Director is in a class by itself for appearance, for quality of lighting and for soundness of investment. Be sure you have the complete story on the Smithcraft DIRECTOR when planning lighting installations. Ask us to send you our Smithcraft Director folder.

Photograph shows Director Installation in the offices of the Credit Representative of the First National Bank of Boston, Empire State Building, New York.

BUY LIGHTING — NOT FIXTURES. INVEST IN AMERICA'S FINEST FLUORESCENT LIGHTING by
Smithcraft
LIGHTING DIVISION
CHELSEA 50, MASSACHUSETTS

After the sun goes down

Photo courtesy Homelite Corp.

use TIREX

Tight construction schedules often mean working after the sun goes down. Without dependable portable lighting, shovel work and other construction jobs can be dangerous. If electrical cords fail, work and profits stop. That's why your lighting equipment should be wired with Simplex-TIREX Cords.

TIREX is the toughest, most abrasion-resistant cord made. It resists the crushing action of truck tires. It can take the beating of sharp chunks of rock dropping on it. It resists oil and flame. It is extremely flexible.

TIREX is the only portable cord made with Selenium Neoprene Armor. It is unequaled for balanced resistance to water, acids, and sunlight. Because of these qualities, it is exceptionally long-lived. All TIREX Cords are cured in lead.

Whether the sun goes up or down, you can do no better than to specify TIREX for all your electrically-operated portable equipment. For any job, no matter how tough, requiring the use of portable cords or cables, be sure that you get TIREX.

Simplex WIRES & CABLES

TIREX CORDS AND CABLES *are made only by the*

SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.

You don't need an umbrella for...

KILLARK

All-Weather
ALUMAILOY ELECTROLETS

• VAPOR-TIGHT FIXTURES

• SERVICE ENTRANCE FITTINGS

• PLUGS & RECEPTACLES

• CLUSTER LITES

They can't Rust...

and won't Corrode...

or Stain!

Fair-weather fittings just can't be trusted. Ordinary iron fittings begin to fail you almost the instant they are installed—rusting a little more after every heavy downpour, corroding bit by bit in an atmosphere of industrial fumes.

But if it's a lifetime friend you want, a fitting that doesn't have to be pampered, then you want the *permanent installation* values that only a Killark Electrolet can give you. That's because Killark's exclusive Alumalloy construction is unaffected by rust or corrosion, ignores rain, snow, heat or cold... remains true to your quality installations in other ways, too: is lightweight but strong in service; safe and non-sparking; roomier for easier splicing; smooth and burr-free inside and out.

"For Fittings You Can Trust—Come Rain or Shine—Specify KILLARK."

K
KILLARK
ST. LOUIS

Killark ELECTRIC MANUFACTURING COMPANY

Vandeventer and Easton Aves. St. Louis 13, Missouri

SALES OFFICES and WAREHOUSE STOCKS

Dallas	1901 Griffin Street	Philadelphia	2014 Chancellor St.
Denver	1073 Galapago	Pittsburgh	50 26th St.
Detroit	8319 Mack Ave.	San Francisco	714 Harrison St.
Los Angeles	412 Seaton St.	Seattle	4130 First Avenue South
Columbus	2700 E. Main St.	Minneapolis	826-27 Andrus Bldg.
Kansas City, Mo.	616 W. 26th St.	New York	600 W. 181 St

SALES OFFICES and WAREHOUSE STOCKS

SALES OFFICES

let's lay it

on the line !

In almost every instance, aluminum conductor offers savings over copper. By one standard, the ASTM specs, aluminum conductors may look the same. By other standards, the electric light and power industry's own, Alcoa® Aluminum Conductor is a standout.

Here are the plus factors you get when you buy Alcoa Aluminum Conductor, and without paying a penny more!

1. Every run tested throughout every production phase for metallurgical, mechanical and electrical uniformity.

2. Consistently uniform manufacture and tight stranding.

3. Cable for every service requirement including designs for special applications.

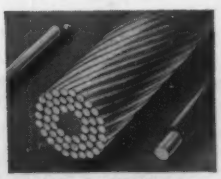
4. The services of the largest and best qualified headquarters and field engineering staff in the industry.

5. The latest developments and newest applications backed by Alcoa's unequaled 55 years of experience and leadership.

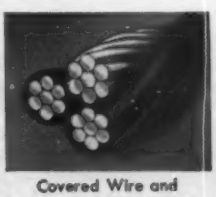
ALUMINUM COMPANY OF AMERICA
2104-D Alcoa Building • Pittsburgh 19, Pa.

ALCOA ALUMINUM

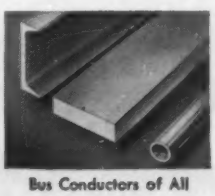
ALUMINUM COMPANY OF AMERICA



ACSR and All-aluminum Wire and Cable



Covered Wire and Service Drop

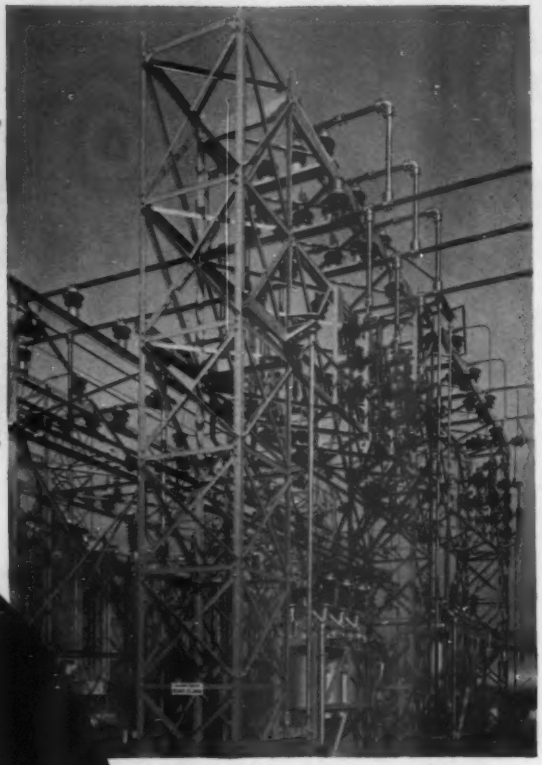


Bus Conductors of All Types

Accessories for All Conductors

Your Source of Complete RESPONSIBILITY When you specify ANDERSON

CONNECTORS, CLAMPS, FITTINGS & ACCESSORIES



★ABW DESIGN MEANS QUALITY *plus* STRENGTH in the RIGHT PLACES

Consult one of our nearest 20 representatives or contact our main office.

for your SUBSTATIONS

Anderson Products have been designed, engineered and manufactured to a "formula" laid down by *the most exacting service conditions.* Each connector, clamp, fitting or accessory is *guaranteed* to withstand extreme short circuit currents and overload conditions far in excess of rated capacities. This extra measure of dependability, *in the broadest line of electrical products offered by any one manufacturer,* is your assurance of safety, efficiency and longevity of service.

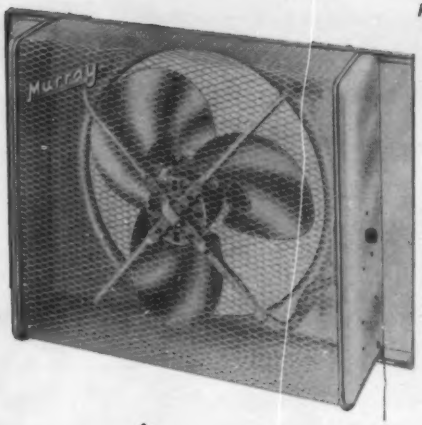
Aluminum & Bronze POWER CONNECTORS • CLAMPS • FITTINGS • ACCESSORIES
for SUBSTATION • TRANSMISSION • DISTRIBUTION SYSTEMS *for over a Quarter Century*

ABW

ANDERSON BRASS WORKS, INC.

P. O. DRAWER 2151 • BIRMINGHAM 1, ALABAMA

Murray 20" Window Fan
Reversible or Exhaust—
Only, 1 or 2 speed



Murray 30" Window Fan
Reversible or Exhaust—
Only, 1 or 2 speed

Murray fans

offer dealers even more in 1954

The '54 fan season promises to be the biggest in ventilating history. More people are "ventilating-conscious", "ventilating-anxious" than ever before.

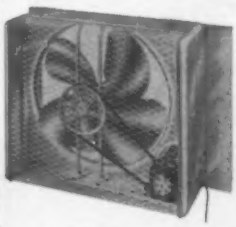
The '54 Murray line is even more complete, offering a type of attic or window fan to fit every home, every pocketbook.

Murray's '54 advertising campaign is geared to make even more of your "ventilating-conscious", customers "Murray-anxious".

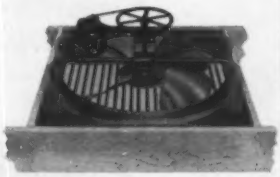
The '54 Murray line offers dealers even greater sales volume, even higher profits, even more satisfaction than ever before.

For full information on dealer and distributor franchises and free catalog, write . . .

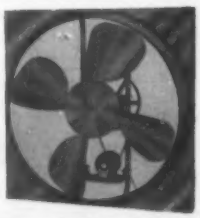
Exclusive National Sales Agents for Murray Fans
H. C. Biglin Co., Inc.
177 Harris St., N.W.
Atlanta, Ga.



Murray 24" Window Fan
Reversible or Exhaust—
Only, 1 or 2 speed



Murray Attic Fan
Vertical Discharge



Murray Attic and
Industrial Fans
Horizontal Discharge

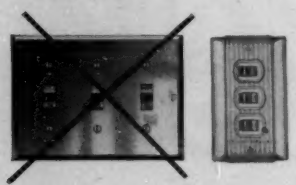
Murray 16" Window Fan
Portable room-to-room

Murray Company of Texas, Inc.
VENTILATING FAN DIVISION • ATLANTA, GA.

P&S® DESPARD LINE® The Original Interchangeable Line

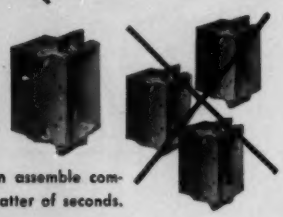
Wire THE MODERN WAY

Two or three devices in the space ordinarily required for one . . . for a neater, better-looking job.



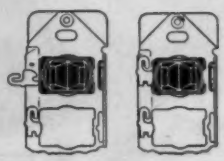
SAVE ON WALL PLATES

SAVE ON BOXES



. . . and, you can assemble combinations in a matter of seconds.

NO TOOLS NEEDED



Just insert the device and engage cam.

Here's How P&S DESPARD Builds Business For You

- **Smaller Inventories—Smaller Investments**

  With a small stock of P&S Despard devices you are prepared to assemble practically any desired combination. You can give more service, faster, with a smaller inventory—and a smaller investment. Small, compact P&S Despard devices take up little room on your shelves—weigh much less than old-fashioned devices.

- **Makes Your Job Easier—Simpler**

  No need to stock (or wait for) special factory assembled combinations and clumsy, expensive multi-gang plates—no need for large bulky boxes. You can cope with the multitude of controls needed in modern institutional and commercial buildings—provide for real electrical convenience in modern homes—and assemble these good-looking combinations right on the job quickly and easily.

- **Builds a Reputation for Quality**

  Thousands of P&S Despard installations throughout the country are proof of the dependability of these precision-built devices. T-rated switches and double grip outlets meet Federal Specifications. You can be sure of a trouble-free installation, with no come-backs.

- **Gives You Merchandise You Can Sell**

  The P&S Despard Line looks different—and is different. The smartly styled, functional combinations have eye-appeal—yet, from a practical viewpoint, provide more convenience per dollar than any other line on the market. Build your business with P&S Despard beauty, convenience and dependability.

Use the coupon to get your copy of P&S Catalog 49.

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YOU EXPECT THE BEST VALUE FROM G-E FLUORESCENT LAMPS

Invisible coating helps new G-E Rapid Start Lamps light faster

THE film of water that condenses on a fluorescent lamp in wet weather is so thin the lamp hardly feels damp. Still, it can connect the ends of the lamp and set up a miniature short circuit. It doesn't injure the lamp. Just steals enough current so the lamp is slow in lighting.

There's one fluorescent lamp, though, that doesn't get sluggish in moist air: the General Electric Rapid Start Lamp.

It has an invisible coating of General Electric silicone, called Dri-Film*. The photo shows what it does to water on the lamp. Makes it stand up in separate drops. In between are dry areas that break the electrical contact. The short circuit doesn't get started. The lamp does.

G-E Dri-Film* doesn't rub off. It's an example of why you expect the best value from G-E fluorescent lamps. For free booklet, "Facts About Rapid Start", write to General Electric, Dept. 166-ES-4, Nela Park, Cleveland 12, Ohio.

*REG. U. S. PAT. OFF.

You can put your confidence in—

GENERAL ELECTRIC

In electrical installations *where QUALITY counts* use CONDULETS*

Quality does count in practically every electrical conduit installation that you make. When you use CONDULETS you know that you are putting in electrical equipment of the highest quality, because CONDULETS have been doubly tested . . . in the factory and in the field.

Crouse-Hinds quality control assures a long-lasting product and field records prove it by the test that only time can give. Thousands of CONDULET installations are still in tip-top condition after twenty, thirty, or even more than forty years of dependable service.

The illustration at the right shows four of Crouse-Hinds' basic quality features that are common to all CONDULETS. The fifth, Wedge Nut Fasteners, is an exclusive Crouse-Hinds feature that has made Obround CONDULETS preferred by electricians everywhere.

1. **Taper tapping.** Condulet threads are taper tapped to match tapered conduit threading. Makes a rigid joint that will not loosen. This assures permanent ground continuity . . . important for safety.
2. **Integral bushing.** A smooth rounded surface protects wire insulation.
3. **Material.** Feraloy . . . a special alloy that is strong and tough, resists corrosion, and gives sharp, full threads
4. **Finish.** A triple treatment provides long-lasting protection . . . exceeds Federal and U. L. specifications.
5. **Wedge Nut cover fastener.** Clear cover opening . . . no projections. No loose parts . . . Wedge Nuts and screws self-retained. No screw holes to align.

More than 15000 items are listed in the Condulet Catalog including a complete explosion-proof and dust-tight line for use in hazardous locations.

On your next job, use CONDULETS . . . they're made right to last longer.

**CONDULET is a coined word registered in the U. S. Patent Office. It designates a product made only by the Crouse-Hinds Company.*

Type EVA Explosion-Proof Lighting Fixture

Type ARE Arktite Receptacle Equipment

Type FS Condulet With Pilot Lamp Receptacle, Switch and Plug Receptacle

Type GUAC Explosion-Proof Junction Condulet

Type VC Vaportight Industrial Lighting Fixture

Type FLF Explosion-Proof Manual Motor Starting Switch Condulet

Type EPC Explosion-Proof Motor Starter and Circuit Breaker Condulet

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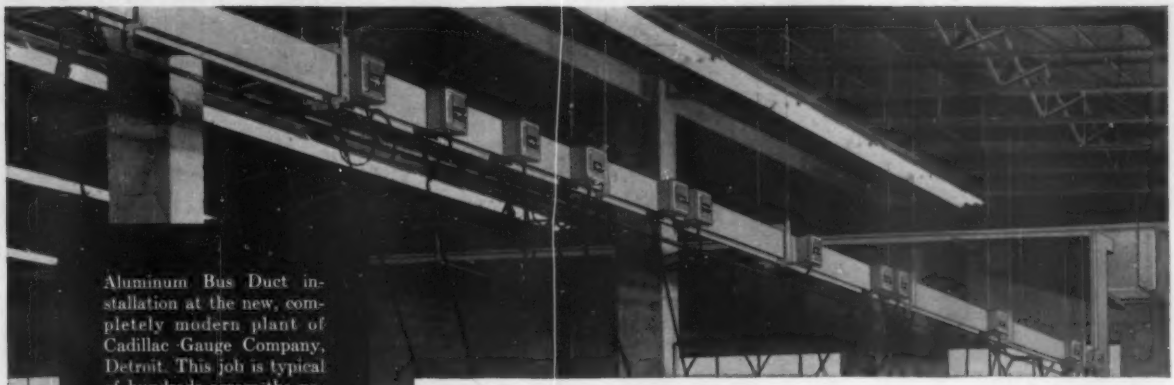
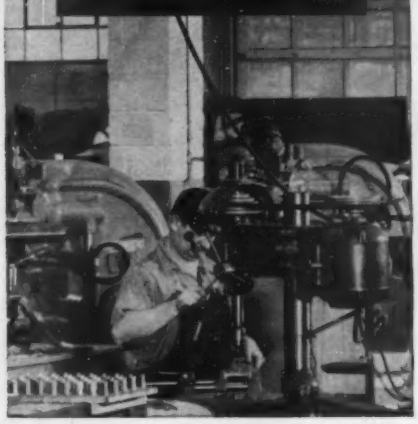
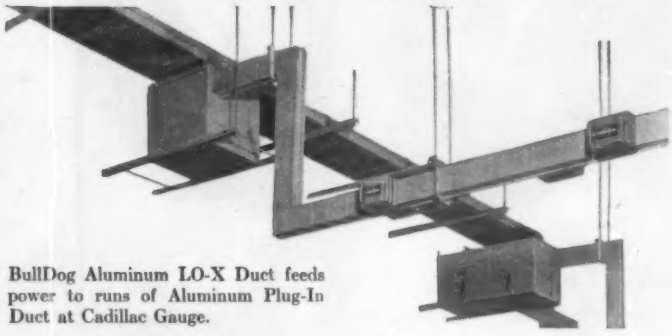


Aluminum Bus Duct installation at the new, completely modern plant of Cadillac Gauge Company, Detroit. This job is typical of hundreds across the nation where plants are saving money by specifying BullDog Aluminum BUStribution Duct.



BULLDOG ALUMINUM BUStribution® DUCT



BullDog Aluminum LO-X Duct feeds power to runs of Aluminum Plug-In Duct at Cadillac Gauge.

Everything* you expect in bus duct!

***PERFORMANCE:** If you're looking for safe, efficient, low cost electrical distribution, check into BullDog BUStribution Duct with aluminum bus bars. Seven years of exhaustive research and hundreds of actual installations prove that aluminum bus duct will provide trouble-free, economical, and efficient performance. Aluminum is no experiment or substitute — it is here to stay. Aluminum bus duct is listed by Underwriters' Laboratories, Inc., and carries the same guarantee as BullDog's other systems.

***INSTALLATION:** Runs of aluminum bus duct can result in a considerable weight savings. This light weight, plus BullDog's patented scarf-lap joint, makes installation simpler, faster, more economical. Like all BullDog BUStribution Duct Systems, aluminum bus duct is completely reusable. It is completely interchangeable with other BullDog Duct Systems, plugs and accessories.

***ECONOMY:** Because you save in the original purchase price, in installation and operation costs, BullDog aluminum bus duct brings you the lowest possible current-carrying cost per ampere per foot.

Get complete information on Aluminum LO-X Duct (for feeder and welder circuits) and Aluminum Plug-In Duct (for branch circuits). Consult your local BullDog Field Engineer, or write BullDog Electric Products Company, Dept. ES-44, Detroit 32, Michigan. ©BEPCO

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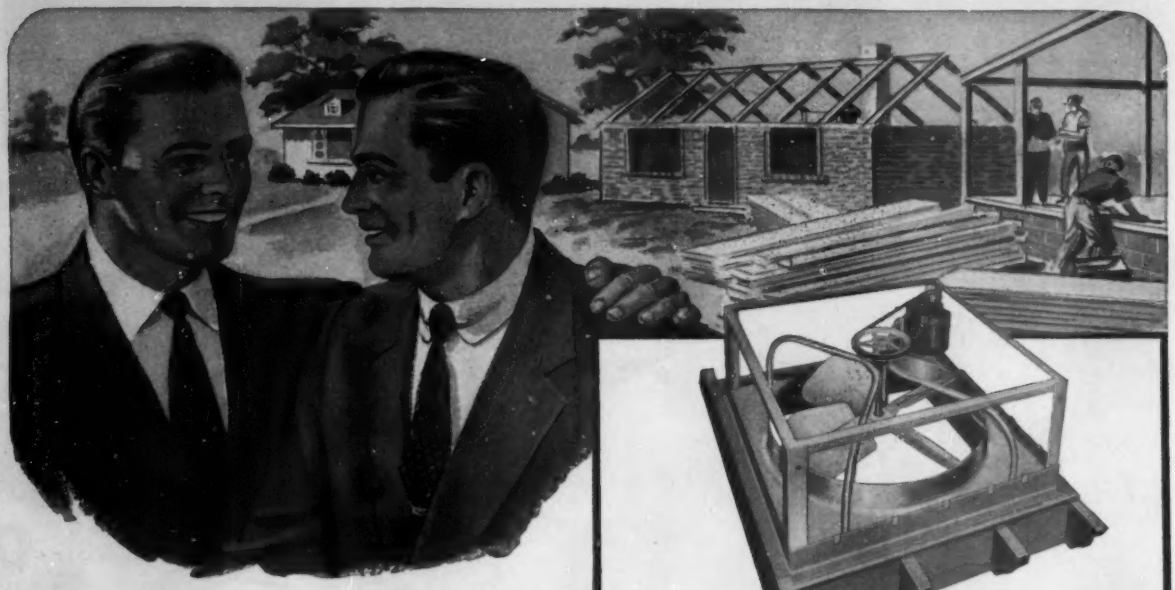
LAU 1954 Fan Facts

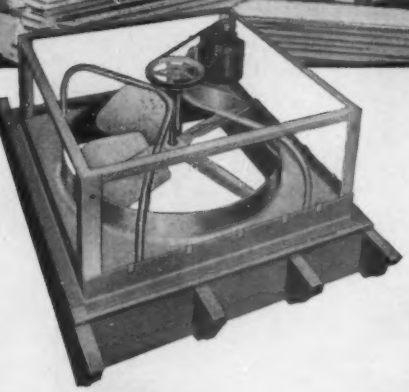
Try this LOW-COST way to make more friends and profits for your business!



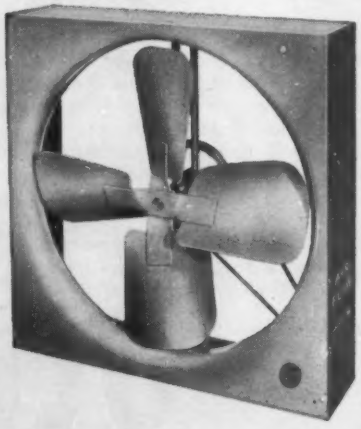
You profit quicker . . . and sell easier when your homes and buildings feature "built-in extras" that add so much to the comfort and convenience of the buyer.

Make friends and customers of your prospects by installing LAU "Niteair" cooling. Just a flip of the switch and these superior fans send gentle, cooling, refreshing breezes flowing through the home. Hot, stagnant air is quickly expelled.

Quick . . . easy . . . and economical to install. LAU "Niteair" Fans make friends and really JUMP profits for you. Plan to install the tested, proven LAU "Niteair" now!



LAU "Niteair" Rancher Fans. Designed for homes with low-pitched roofs. Available in four sizes—24", 30", 36" and 42", with air delivery to meet every demand.



LAU "Niteair" Panel Units. Newly designed, ruggedly constructed. Discharge capacity for every requirement. Five sizes—24", 30", 36", 42" and 48".

Guaranteed 5 years

Lau fan ratings are Certified by the PFMA and carry UL approval. Fans are guaranteed for 5 years and motors carry a one-year warranty.

THE LAU BLOWER COMPANY, **2019 Home Avenue • Dayton 7, Ohio**
Write today for catalogs and further information.

Now! Complete Flexibility

THE NEW, IMPROVED *Wheeler* DURATACH LINE

Complete Interchangeability

New design permits use of any Duratach Reflector with any Duratach Canopy Assembly, thus easily adaptable to any installation.

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to meet all lighting requirements . . . basic PENDANT installation, with simple conversions to SIDE OUTLET and OUTLET BOX.

5 Reflectors

each designed to do a specific lighting job

RLM Standard Bowl

RLM 30° Angle **RLM Deep Bowl**

Shallow Dome **Elliptical Angle**

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For complete information write for New DURATACH BULLETIN

new National Electric

NEPCONOL® TYPE

UF CABLE

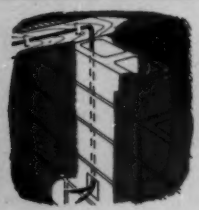
most economical • for direct burial
• underground feeders
• branch circuits

Single conductor in sizes 14 through 4, standard color is black

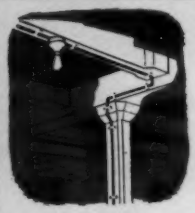
Two conductor, with or without ground wire, and three conductor in sizes 14 through 10, standard color is ivory.

Buried direct in earth. Nepconol Type UF is ideal for wiring between buildings, for floodlighting, drive-in theaters and other outdoor wiring.

Imbedded in plaster.



In masonry block or wall tiles.



Branch circuits in moist, damp, corrosive locations.

Tough thermo-plastic insulation gives Type UF Cable its damage-resistant characteristics. The multi-conductor cables are strengthened by a fibre glass member between conductor insulation and cable jacket . . . aids in stripping conductors easily.

Put this dependable new cable to work for you in your next underground wiring job. Type UF single and multi-conductor cable is designed for underground wiring—for direct burial as feeders or branch circuits when provided with overcurrent protection.

Use Nepconol Type UF for both exposed and concealed work in dry, wet or corrosive locations; for installation inside masonry block or wall tiles; for imbedding, when suitably protected, in plaster and shallow chase masonry.

Note: Also recognized for use as Type NMC (non-metallic sheathed cable, corrosive resistant) National Electric Type UF Cable has been listed by Underwriters' Laboratories, Inc., and is provided for in the 1953 National Electrical Code.

EVERYTHING IN WIRING POINTS TO

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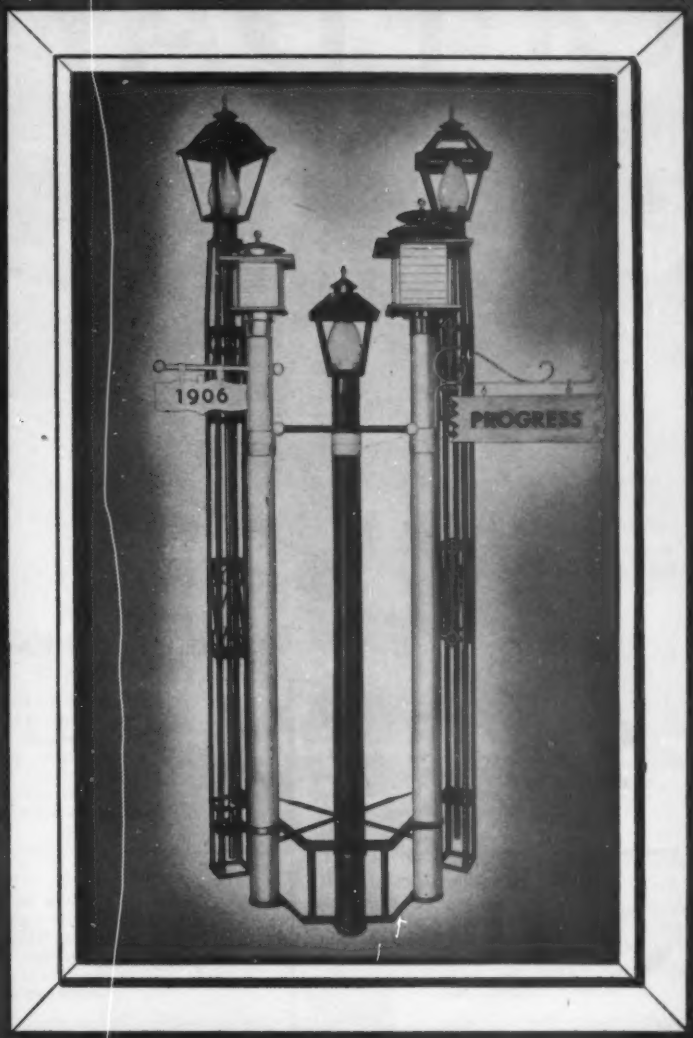
3 Plants • 8 Warehouses • 34 Sales Offices

Your Volume will be bigger than ever . . . with this

NEW Progress POST LANTERN DISPLAY



Progress holds all records for Post and Lantern sales with the industry's most complete line. Now, we'll break these records with this attractive, compelling new display — occupying only 2½ ft. of floor space.

NEW PL-44 POST LANTERN DISPLAY—Consists of One Ornamental Iron Base, Two No. TP-100 Aluminum Posts, One No. 385 Black Steel Post, One each Ornamental Iron Posts Nos. 102 and 103 and One each Post Lanterns No. 990, 991, 9810, 9912 and 9914 . . . plus one each Nos. 105 Redwood Sign and 106 Aluminum Sign.

Write for Progress Pre-Views and Catalog 102

PROGRESS MANUFACTURING COMPANY, INC.

Leaders in Lighting for Half a Century

CASTOR AVENUE AND TULIP STREET • PHILA. 34, PA

CFI DAY-LINE®

(COMFORT FOR INDUSTRY)

Easy to handle

Contractor features include knock-outs and fittings for pipe, chain, stem and messenger cable suspension; no-sag, no-bend one-piece reflector; simplified wiring.

Easy to install

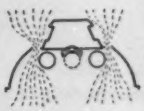
LOOK AT THESE EXTRA VALUE USER FEATURES

ALL-WHITE PORCELAIN REFLECTORS. Outside as well as inside, entire one-piece reflector is finished in snow white porcelain enamel—providing maximum high reflection surface.

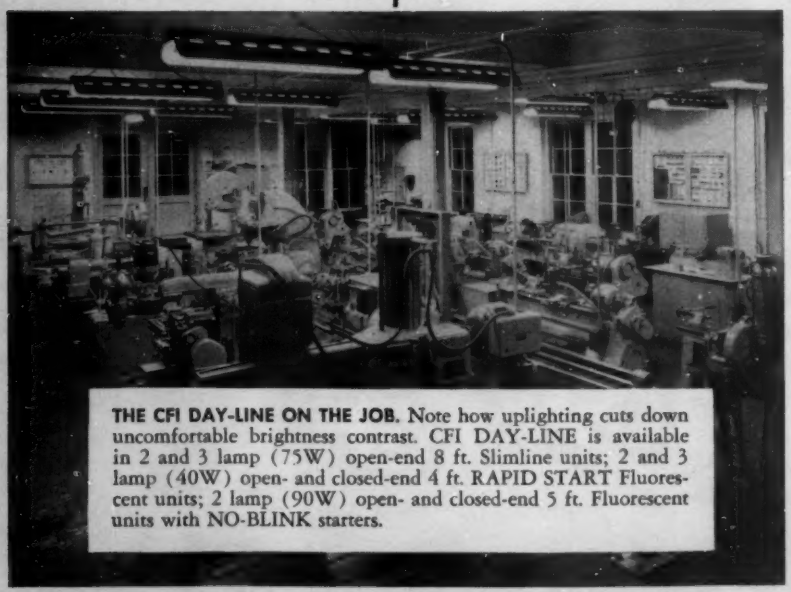
COMFORT FOR INDUSTRY. Die-embossed apertures in reflectors provide 10% up-lighting for improved visual comfort and freedom from irritation and nervous fatigue due to eyestrain.

TURRET* SOCKETS. Sturdy, vibration-proof Turret sockets are standard equipment on all CFI DAY-LINEs—providing positive lamp seating and simple lamp installation or removal.

*®G. E. Co.



COOLER, CLEANER OPERATION. A gentle flow of air passes through the apertures reducing dirt and dust deposits. This "breathing" action keeps fixture cooler, cleaner and more efficient.



THE CFI DAY-LINE ON THE JOB. Note how uplighting cuts down uncomfortable brightness contrast. CFI DAY-LINE is available in 2 and 3 lamp (75W) open-end 8 ft. Slimline units; 2 and 3 lamp (40W) open- and closed-end 4 ft. RAPID START Fluorescent units; 2 lamp (90W) open- and closed-end 5 ft. Fluorescent units with NO-BLINK starters.

YOU'LL FIND THE DAY-BRITE REPRESENTATIVE IN YOUR AREA HELPFUL AND COOPERATIVE

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DAY-BRITE
Lighting Fixtures

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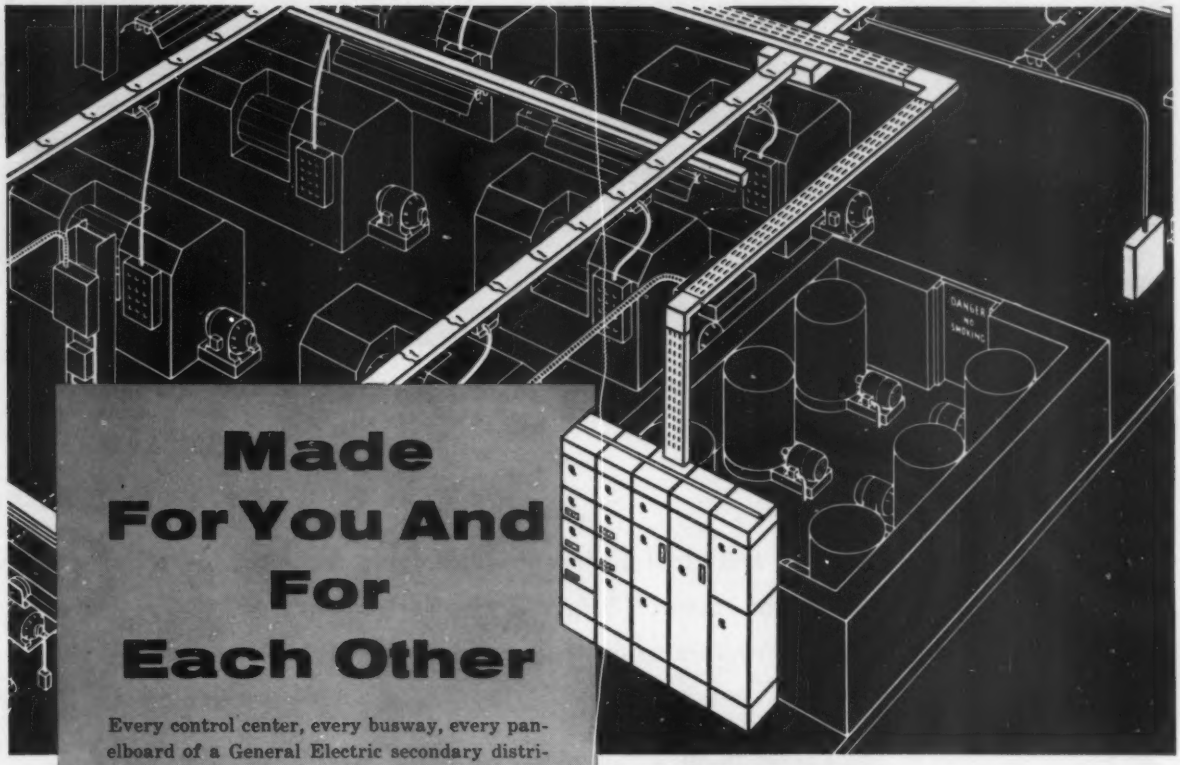
NATIONALLY DISTRIBUTED EXCLUSIVELY THROUGH LEADING ELECTRICAL WHOLESALERS

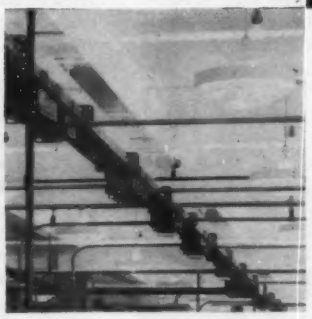


Made For You And For Each Other

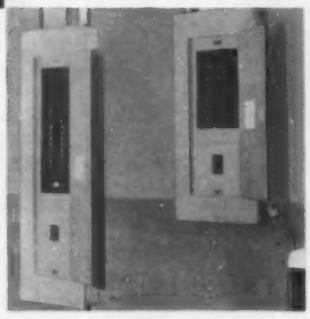
Every control center, every busway, every panelboard of a General Electric secondary distribution system is a leader in its field in its own right. Put them together and you gain still more from *complete integration.* For all these products are engineered to work together as a *system* . . . all the way from transformer to point of use. This is your complete assurance of *all* the flexibility, reliability and safety that can be built into this vital area.

G-E Motor Control Centers provide convenient, compact grouping of motor starters, other control equipment and feeder protection. They assure maximum safety, adaptability and convenience.

G-E Busway Systems fit the needs of each load area, yet permit system expansion with factory growth.



G-E Lighting & Distribution Panelboards, fusible or circuit-breaker types, provide positive circuit control and protection.



FOR COMPLETE INFORMATION, WRITE GENERAL ELECTRIC COMPANY, DISTRIBUTION ASSEMBLIES DEPARTMENT, PLAINVILLE, CONN.

Make it G.E. all the way through the vital low voltage area from transformer to point of use.

GENERAL ELECTRIC

Front view of Clinical Building of Bethesda Medical Center.

Supplying an electrical system for the highly technical largest medical research center in the world, provided electrical contractors with many interesting problems

Electrical system for medical

◆ THE NEW CLINICAL CENTER of the National Institute of Health is located in Bethesda, Maryland, within the metropolitan area of Washington, D. C. It is the largest research center of its type in the world. The Center will constitute the nucleus for a coordinated clinical-laboratory research program in long term illnesses that are the greatest causes of disability and death in this country. With its many varied facilities and the fact that it combines clinical and laboratory research, the Clinical Center is expected to speed up the discovery of many of today's most-searched-for reliefs and remedies in long term illnesses.

The brick and reinforced concrete clinical building rises 14 stories above ground level and has a basement, sub-basement and sub-sub basement. It has a floor area of 1,246,850 square feet. This space will be utilized for approximately 550 hospital beds, research laboratories, and required utility space. The Center has two assembly rooms, complete with the most modern projection, sound, and stage lighting equipment; two operating areas; a chapel with interdenominational revolving altar; cafeteria; morgue; 13-position telephone switchboard; 12 passenger elevators; four service elevators; and four dumb-waiters plus the many other necessary facilities. The clinical building represents the ultimate in combining a hospital with research facilities.

The several associated existing buildings at the site will supplement the facilities of the new clinical building.

Spot network for power

The spot network system is used for power distribution to the center and associated buildings since it provides greater reliability than any other alternating current system and is most adaptable to changing load conditions. This type system also provides better regulation, lower losses, and greater convenience in operation and maintenance.

Utility service for the center is received at a substation located on the property owned by the NIH. It will eventually accommodate three three-phase underground 34-kv cables, serving three 20,000-kva transformers; however, only two 34-kv feeders and two 20,000-kva transformers are installed at present. These transformers step the voltage down to the primary distribution switchgear that distributes power to the entire area. This metal-clad switchgear and the power transformers are owned by the Potomac Electric Power Company. The power company supervises their equipment in the substation, in addition to NIH's incoming breakers and the battery-changing control panel, from a remote location. This supervision is

This National Institute of Health-owned substation switchgear handles the power for complicated research operations except when emergencies occur.

research

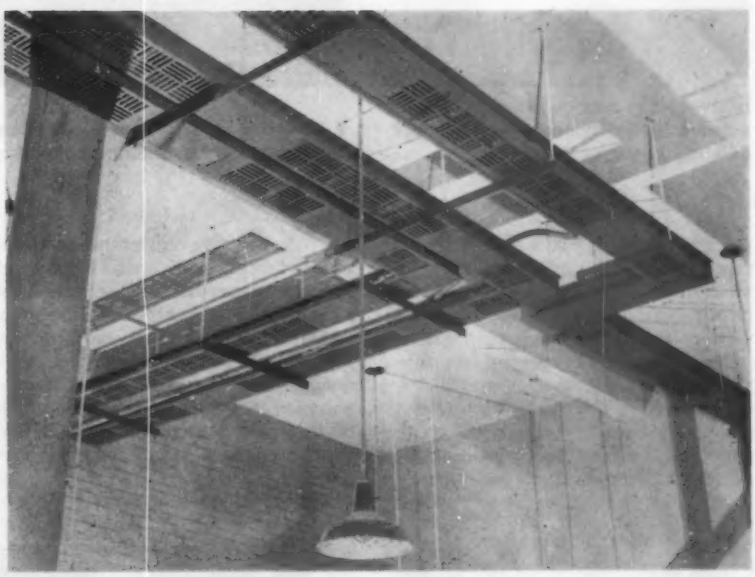
by L. P. Sponholtz

Engineering and Service Department
Westinghouse Electric Corp.
Washington, D. C.

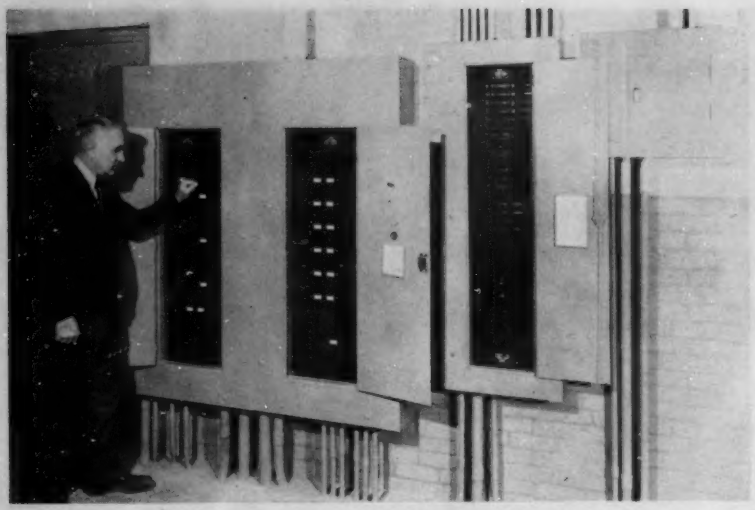
by means of a Visicode supervisory control station that transmits and receives control signals over leased telephone lines.

Three switchgear breakers

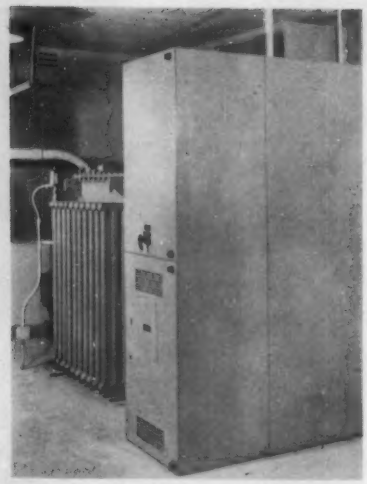
The NIH-owned metal-clad switchgear is located in the substation, opposite to and facing the power company's switchgear. NIH's switchgear is provided with three incoming breakers only two of which are presently bus-connected to the 13.2-kv bus of the power company's switchgear. The third tie will be made when the last power transformer is installed. The switchgear is made up in three sections with cable from each section feeding every power center in the area. The three bus sections are connected together through tie breakers by means of a 13.2-kv transfer bus. All 13.2-kv breakers in the substation are draw-out air circuit breakers with an interrupting rating of 500,000-kva.



Busway runs in ceiling of equipment space in the Clinical Building are typical of such applications throughout the center.



Shown are three of the more than 450 lighting and power panelboards used in the electrical system of the Center's Clinical Building.



One of the Clinical Building's three 500-kva emergency transformers and its associated switchgear.

High-voltage side of three 1,000-kva network transformers for Clinical Building power center.

Low-voltage side of three 1,000-kva network transformers for Clinical Building power center, showing network protectors.

Located in the substation is the remote control panel which provides indication and control for the retransfer to normal supply for all power centers having an emergency transformer supply. In addition, there are batteries and automatic battery-charging equipment to supply the 120 volts d-c necessary for the control circuits of all air circuit breakers in the substation.

Steam distribution

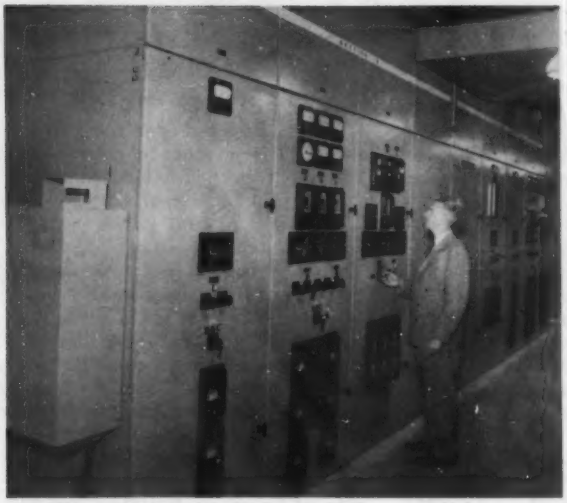
The boiler plant serves as the center for the distribution of steam for heat, laundry, cooking, and sterilization. It also contains the air-conditioning equipment, a compressed air system, and a 5,000-kva turbine generator for emergency power should the main power sources fail.

From the substation, three underground, three-conductor, three-phase, 500-MCM cables feed the boiler plant through its 16,500-connected-kva transformer capacity.

Three 5,000-kva, three-phase, inerteen-immersed power transformers, with high-voltage grounding and disconnect switches, step the voltage down from 13.2-kv to 2,400 volts. These transformers have two functions. The first and primary function is to supply power for driving the air-conditioning equipment, which is rated at 5,250 tons. Second, under extreme emergency conditions in case of complete loss of normal service, when all air conditioning load is disconnected, the transformers may be used to transform the 2,400-volt output of the 5,000-kva emergency generator to 13.2-kv, the primary distribution voltage at the substation.

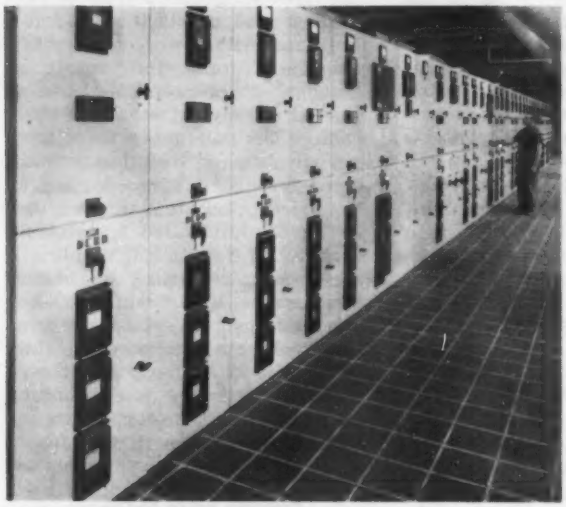
Mounting of protectors

Three 500-kva, three-phase, inerteen-immersed network transformers, with high-voltage ground-

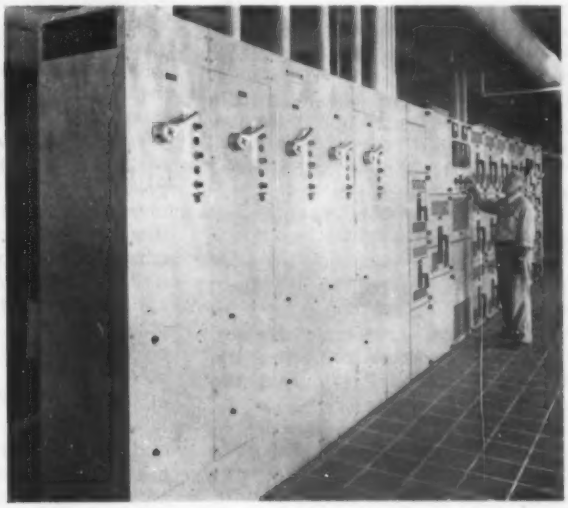


Substation switchgear owned by Potomac Electric Power. Company provides two power sources for the Center.

Low-voltage distribution switchgear for one of the six power centers in the Clinical Building.



2400-volt switchgear housed in the boiler plant. Steam provides power for several clinic operations.



Low-voltage switchgear and motor control center in boiler plant of the Medical Research Center.

ing and disconnect switches, are supplied from the same three incoming cables and step the voltage down to 120/208 volts. Integrally mounted with each transformer is a 1,500-amp open-type network protector. The load sides of these are bussed together and feed the low-voltage metal-enclosed switchgear through a main breaker. Loads supplied by this switchgear are lighting and power panelboards, incinerator control boards, battery-charging equipment, motor control centers, and boiler-plant auxiliaries.

The motor control centers are mounted adjacent to each end of the low-voltage switchgear and provide a unified group of prefabricated structures solidly bussed together. These centers integrate at one location equipment and devices for motor control, motor protection, and circuit protection for the cooling tower fan motors, and fire pump. They also function to increase personnel and machine safety as well as being economical to install, and convenient to maintain.

One 300-kva inerteen-immersed emergency transformer is also located in the boiler plant. It has an integrally-mounted high-voltage three-position grounding and disconnect switch. The 13.2-kv emergency feeder voltage is stepped down to 120/208 volts and will supply power through a tie breaker in event of complete failure of the normal supply.

Power for emergency

Supply for this emergency transformer originates from a completely separate source of the Potomac Electric Power Company's system and does not feed through the previously discussed substation. In addition to supplying the emergency transformer in the boiler plant, this source also supplies emergency transformers located in

three vaults of the clinical building. The primary distribution breaker cubicle for this emergency supply is located in one of the existing buildings. This emergency source has no connection with the 5,000-kva emergency turbine-generator supply.

The 5,000-kva turbine-generator, along with its associated switchgear, controls, and auxiliaries, functions to provide an adequate and dependable source of electric energy for essential services in event of total power failure. It is connected to its associated 2,400-volt switchgear through 114 feet of 2,000-amp metal-enclosed bus.

Loss of feeders

In the event of the loss of all but one of the 34-kv feeders supplying the substation, the 5,000-kva turbine-generator will be started and made ready for service. In the event of the loss of all 34-kv feeders, all incoming, out-going, and tie breakers of the NIH-owned 13.2-kv switchgear located in the substation will be manually opened. This will isolate the NIH switchgear from the Potomac Electric Power Company's switchgear and will sectionalize the bus into three sections.

All 2,400-volt motor feeder breakers in the boiler plant will trip since they are equipped with under-voltage protective devices. The three breakers connecting the 2,400-volt secondary supply of the 5,000-kva transformers to the 2,400-volt switchgear bus will remain closed. All motor controllers supplied from the 120/208-volt switchgear that are equipped with undervoltage protection will trip automatically; those controllers equipped with low-voltage release will be manually tripped.

The turbine-generator is now connected directly to the 2,400-volt bus by closing the generator breaker control switch. Moving this switch to the closed position accomplishes two additional functions by means of slip contacts. The reverse-current relays normally functioning with the secondary breakers of the 5,000-kva transformers are made inoperative and the closing circuits of the three 13.2-kv incoming feeder circuit breakers in the NIH switchgear in the substation are made inoperative. This then permits power to flow from the 5,000-kva transformers to the substation while preventing possible paralleling of the emergency-generator supply with the power company's system should normal supply be restored.

Having connected the 5,000-kva emergency generator to the 2,400-volt bus, the 5,000-kva power transformers are energized through their respective secondary breakers stepping up the generator output voltage to 13.2-kv. Since the network transformers located in the boiler plant are loop-fed from the 5,000-kva transformer primaries, energy is immediately available for steam auxiliaries and vital boiler plant loads. To energize any section of bus in the NIH switchgear in the substation it is only necessary to close its associated boiler plant feeder breaker. By closing one or more of the 13.2-kv substation feeder breakers that supply the power centers, necessary and vital loads can be connected.

During normal operation, a complete emergency generator test can be performed without losing the normal supply to any building except the boiler plant. This is accomplished by a two-position key-type control switch mounted on the generator control cubicle. It is provided with sufficient slip contacts so that when it is turned to the proper position, the 13.2-kv feeder breakers supplying the boiler plant located in the substation are tripped. This insures no interruption of service to other buildings and yet provides a means of completely testing the turbine-generator.

Master control board

Also located in the boiler plant and continuously attended is the master supervisory board. This board: (a) Indicates the open or closed position of the incoming emergency circuit breaker located in Building No. 1. (b) Indicates the open or closed position of all network breakers. (c) Trips open automatically the network protector and the associated primary feeder breaker, if transformer reaches unsafe temperature or pressure. (d) Indicates the open or closed position of the main, normal bus tie, and emergency-tie breakers in the low-voltage switchgear located in vaults 1, 4, and 5 of the clinical building and in the boiler plant. (e) Indicates the open or closed position of the bus ties, incoming breakers, and all feeder breakers of the NIH switchgear in the substation. (f) Indicates the open or closed position for the three 2.4-kv breakers located in the boiler plant. These breakers are equipped with reverse current relays and function to open the secondaries of the 5,000-kva transformers.

Six systems for clinic

Power demands for the Clinical building are met by six power centers strategically located in specially-designed vaults. The arrangement of the power centers features both the horizontal and vertical form of network layout. With the exception of vault 7, each power center consists of three network transformers, three network protectors, low-voltage switchgear and associated interconnecting metal-enclosed bus. An emergency transformer and associated tie breaker is located in vaults 1, 4, and 5. Vault 7 is located just outside of the main building and has two network transformers with associated network protectors. The load sides of these two protectors are bussed together and supply the various load points through cable limiters. All power centers are energized from the substation through three separate underground three conductor, 350-MCM cables. The emergency transformers are supplied from the primary emergency switchgear located in the existing building number one.

The total installed transformer capacity in the clinical building is 16,400-kva, consisting of 14,900-kva normal supply and 1,500-kva emergency supply. All transformers are inerteen-immersed vault-type, with a high-voltage three-position disconnect and grounding switch. Network protectors are integrally-mounted with all transformers fed by the normal supply.

Busway from breakers

From the various feeder breakers in each vault, run the arteries of low-impedance busway forming the basic load-carrying system. In the clinical building alone more than 3,000 feet of ventilated low-impedance busway is used. More than 450 lighting and power panelboards distribute power locally.

As previously mentioned, the power center located in the boiler plant and those located in Vaults 1, 4, and 5 have emergency transformers to supply power in case of normal power failure. The normal operation is with the main and bus-tie breakers closed and with the emergency-tie breaker open. The emergency tie breaker is electrically interlocked with the emergency bus-tie breaker so only one can be closed at any time.

(*Continued on page* 92)

Know the law . . .

Your rights on incomplete jobs

by Arthur L. H. Street

◆ "WHERE will I stand if the building in which I am to install electric wiring and equipment is destroyed by fire or storm before the job is completed?"

Every electrical contractor ought to have a good understanding as to his legal rights in such a contingency. If he is not sure on the point he should either talk the matter over with his attorney or see to it that his contracts are clearly worded in such way as to entitle him to collect pay if his work is destroyed without his fault before it is completed. Special circumstances may dictate that appropriate insurance be carried.

Owner bears loss

It seems that a distinction is to be drawn between instances in which the electrical contractor is called upon to wire an existing and completed building for the owner and instances where the wiring is done as subcontractor on a building that has not yet been turned over to the owner by the prime contractor.

In an early case, the Tennessee Supreme Court recognized that where a contract to improve property was made directly with the owner under such circumstances, and that at every stage in the progress of the building the structure was his, he bore the loss resulting from destruction of the building by fire including the partly completed improvements. The court said: "It is not like a case where a contractor is to furnish materials, do the work, and control the whole operation, and when finished and delivered to be paid for it." (Wilson v. Knott, 3 Humph. (Tenn.) 473.)

Sub-contractor's position

So, it would seem that, in the absence of contrary agreement, if a prime contractor is to be paid only for a completed building—thereby bearing the risk of destruction of his work before completion—the electrical subcontractor who is to be paid by the prime contractor for a completed job is "out in the cold" if, without the prime contractor's fault, the incompleted building, including incompleted electrical work, is destroyed. That is, of course, excepting that there may be insurance covering incomplete work.

However, if the subcontract for the electrical work has been completed and the electrical contractor has become entitled to full payment, it would appear to be equally clear that he is entitled to hold the prime contractor liable for the full amount due him. But this article does not attempt to cover such situations.

We are here principally discussing the right of an electrical contractor who does work directly for the owner of a building to collect pay for incompleted work done before destruction of the building. That right is supported by a decision of the Texas Supreme Court. (Weis v. Devlin, 67 Tex. 507, 3 S. W. 726.)

Owner's responsibility

In West Virginia, a mechanic contracted to put a tin roof on a building at a unit price per square. Before the work was completed the building was destroyed by fire. The owner having refused to pay for the work done, the roofer sued for the reasonable value of the work he had done, and won the suit.

The West Virginia Supreme Court of Appeals reasoned: it was not the roofer's fault that his completed work was destroyed. What he had fastened to the building had become the property of the owner of the building as the work progressed. It was especially unjust that the owner should refuse to pay, in view of the fact that he carried insurance for his own benefit, which covered the roof so far as completed as part of the building. (Hysell v. Sterling Coal & Mfg. Co., 46 W. Va. 158, 33 S. E. 95.)

For similar reasons house painters were allowed by the Mississippi Supreme Court to collect for the value of painting and papering done on a house before it was destroyed by fire. There, too, the owner carried insurance on the house as a finished structure and collected from the insurance company on that basis. (Ganong v. Brown, 88 Miss. 53, 40 So. 556.)

Application to wiring

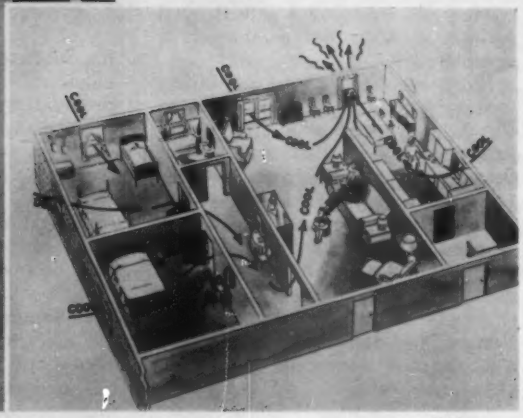
The reasoning in the last two cited cases would apply with full force to installation of electric wiring, etc.

The decisions in the Mississippi and West Virginia cases reflect the general attitude of all of the courts in the country which have been called upon to pass on similar cases. As declared by the Massachusetts Supreme Judicial Court, "In this country, where one is to make repairs on a house of another under a special contract, or is to furnish a part of the work and materials used in the erection of a house, and his contract becomes impossible of performance on account of the destruction of the house, the rule is uniform, so far as the" appellate court decisions "have come to our attention, that he may recover for what he has done or finished." (Butterfield v. Byron, 153 Mass. 517, 27 N. E. 667.)

The writer hopes to be able, in a later article, to discuss in detail the rights of an electrical contractor as a sub-contractor, where before completion of his work and before completion of the building, both are destroyed.

—Lau Blower

Window fans are becoming best-sellers in many manufacturers' fan lines, especially new models which are easily lifted from their window positions for portable use throughout the house. Because of their flexibility in cooling, window fans are particularly attractive to apartment-dwellers and people who do not wish to make permanent cooling installations.



—Viking

1954—another good fan year

by Morris Margolis

◆ THE RESIDENTIAL MARKET represents tremendous possibilities for the sale of ventilating and cooling equipment. In recent years, millions of additional homes, largely in rural sections of the country, have been electrified. Add to this the hundreds of thousands of homes built last year and the 1.1 million homes expected to be built this year, and you can see something of the potential market for exhaust fans in the residential field.

In addition, consider the large numbers of neighborhood and secondary shopping centers that are springing up on the outskirts of all our cities, large and small. These proprietors and shopkeepers are excellent prospects for the sale of the inexpensive, yet efficient, window exhaust fan.

The attic fan is a particularly good item in the South, since according to climatic factors, the best market for attic fans covers the area in the seventeen states from Texas through New Jersey. Many progressive builders in the South consider the attic fan almost a necessity for the homes they build for sale. Of course, there are some groups—homeowners in the lower income groups, renters, and apartment dwellers—to whom the permanent installation of an attic fan is out of the question. For these people, the window fan is ideal, since it provides efficient heat relief at a low cost and does not require permanent installation.

Factors to consider

Several factors must be considered in discussing the market for night cooling fans. Air conditioning has made the public "cool conscious." Far from affecting the fan industry adversely, however, the recent advancements in the field of air conditioning have actually helped the sale of fans by increasing the consumer interest in summer cooling equipment. Figures from the 1953 season bear this out. Window fan sales experienced a striking increase in the number of units sold over the 1952 season, and the dollar volume sales

figures zoomed to almost double 1952 sales. The wall and ceiling model kitchen fan sales increased considerably in the number of units sold, and attic fans showed similar rise in numbers sold, as well as in dollar volume. Most experts feel that this is good indication that increasing consumer interest in summer cooling is benefiting the exhaust fan market.

In addition, purchasing power is still high. And manufacturers' groups, notably the Propeller Fan Manufacturers' Association, are doing much to stimulate public interest in fans. Through a nationwide public relations program carried on in the nation's newspapers and consumer magazines, the P.F.M.A. keeps information on the benefits of kitchen, window and attic fans in the public eye.

Through aggressive promotion directed to this large market—promotion vividly picturing the benefits of night cooling equipment—dealers will realize greater summer sales and higher profits.

How night cooling works

During the day, the sun's rays beat down on the attic roof, raising attic temperatures to as high as 135 degrees. Heat transmits from the attic throughout the entire house, saturating walls and furnishings. Inside-the-house temperatures rise to as high as 105 degrees.

After the sun has set, outside temperatures drop from 15 to 25 degrees. However, because heat is stored up in the house and because there is usually no breeze strong enough to dispel this heat, inside temperatures drop only slightly. The house remains stuffy, hot and muggy.

An attic fan changes this picture entirely. In a matter of minutes, the attic fan will have drawn out all the torrid air in the house, replacing it with cooler, refreshing night air. Inside temperatures begin to drop, and with a constantly recurring fresh supply of cool air, the inside temperature soon becomes the same as the outside. In addition, the gentle, constant flow of night air entering the house speeds up the evaporation of moisture from the skin, a process which helps to keep the body cool.

Working in the same manner, although on a slightly smaller scale, the window fan will efficiently night cool up to four or five rooms, the size of the average small home or apartment. For best results, the window fan should be installed in a window across from the bedroom, so that the sleeping quarters are the first to receive the cooling night breezes as they enter the house.

BUILDING USE:	GENERAL DESCRIPTION
Banks Stores Offices Auditoriums Lodge Rooms Classrooms Theatres Stock Rooms Showrooms	**4 to 6 Minutes Air Change** (1) High ceilings with good construction tend to keep inside temperatures below outside conditions until late afternoon. (2) Applications where high daytime temperature and excessive dust content of the air make higher air changes undesirable. (3) Personnel engaged in light work. (4) All floors below the top floor in a multi-story building.
Bowling Alleys Pool Halls Cafes Dance Halls Skating Rinks Gymnasiums Athletic Clubs	**2 to 3 Minutes Air Change** (1) Occupants usually engaged in mild to fairly strenuous exercise. (2) Higher air change often necessary to remove body heat and dust where crowded conditions occur. (3) Removal of smoke and odors will generally require a high air change.
Hotels Apartments Clubs Tourist Courts Hospitals Sanitariums Rooming Houses	**1 to 1½ Minute Air Change** (1) Peak occupancy occurs at night when outside temperature drop makes comfort cooling effective at low air velocities. (2) Night cooling of building and contents is reflected in lower inside temperatures the following day. (3) Day operation is satisfactory when unoccupied rooms are closed off.

This chart, reproduced through the courtesy of Hunter Fan and Ventilating Co., provides application data for commercial fan installations.

Good sales talk

A graphic explanation of night cooling is the main feature of exhaust fans upon which a promotion can be based. Other important features which are valuable sales tools include such sales points as these:

(1) A cool inside temperature insures against falling asleep hot and perspiring and awakening in discomfort due to a sudden change of temperature during the night. A complete air change once every one to one and a half minutes insures a constant supply of clean, fresh air.

(2) During the humid summer months, the spread of moisture is accelerated and the resulting fungus growth and rot can cause deterioration in walls, ceilings, and foundations. Also, the dampness shortens the life of furniture, paint, and plaster. The positive ventilation provided by an attic or window fan prevents fungus growth and rot, thus lengthening the life of the house and its furnishings.

(3) Both the attic and the window fan are quite inexpensive to operate, the cost amounting to only a few cents a day. The window fan is very low in initial cost, compared to other types of room cooling equipment, and the attic fan because it is classed as a permanent improvement to the house, can be FHA financed. Being a permanent improvement, the attic fan does much to enhance the resale value of a house, and its long life represents long-run economy for the homeowner.

Reaching the market

Residential fan demand does not come as a result of a long-felt need. Homeowners order fans because the heat has made them uncomfort-

(*Continued on page* 91)

by B. Z. Segall, Consulting Engineer

Wiring of gasoline dispensing stations

◆ FOR SOME TIME there has been considerable discussion as to the intent of the National Electrical Code relative to the wiring for the equipment for a gasoline dispensing station and/or a gasoline service station. The new requirements of the 1953 Code, in Article 510, Specific Occupancies, states in Section 5120 quite definitely just what is required for the wiring installation.

The following is a discussion of these requirements. Much of this exposition is a clarification of the many ideas, opinions and criticisms expressed at various meetings which have recently been held to discuss these 1953 Code revisions. It is hoped that this commentary will stimulate further thinking and evoke further discussion and comment from those with actual field experience. In this way, it will be possible to offer further clarification for some of the actual field problems which seemingly may not be answered by these Code standards.

Stations defined

Gasoline dispensing and service stations are classified as locations where (1) gasoline, or (2) other flammable liquids are transferred to the fuel tanks of self propelled vehicles, i.e., automobiles, trucks, busses, airplanes, etc. This classification also includes locations where these flammable liquids are transferred to auxiliary fuel tanks.

The point of greatest hazard in these locations is the dispensing island. Two types of islands are defined. Figure 1 shows the type where the island is actually an elevated area above the surrounding ground or driveway level.

In many cases, however, there is no elevated area; the pumps, etc., being installed directly on ground level, or at driveway level. The Code in these cases defines the dispensing island area as shown in Figure 2.

The other areas involved in these

Part I

The second and concluding part of this article will appear in the May issue of Electrical South. Reprints of this article in complete form will be available in limited quantities to readers who request them. Direct requests to the Editor, Electrical South, 806 Peachtree St., N.E., Atlanta 5, Ga.

dispensing and service stations, such as the sections used for lubricating vehicles, the other service and repair areas, the office, the salesroom, the compressor room, may or may not include hazardous locations. The requirements for the electrical wiring and equipment in these other areas are not covered in this section, except by reference to the governing requirements set forth in the Specific Occupancies' requirements of Section 5105—Commercial Garages, Repair and Storage.

Hazardous areas

Figure 3 illustrates the classification and extent of the hazardous areas which will be found (1) on a dispensing island, (2) within a dispensing island, as within the elevated section shown in the left hand section of the diagram, or (3) under the island, as regards the conduit, wiring, etc., feeding underground to the island electrical equipment.

It should be noted that in the right hand section of the diagram the 18" sections as defined in Figure 2 above, overlap to give, in effect, a continuous dispensing island area. For isolated dispensing

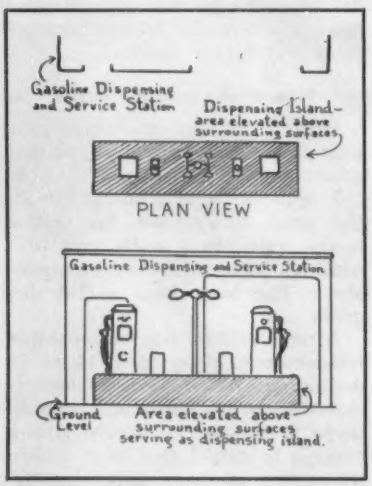

Gasoline Dispensing and Service Station
Dispensing Island—area elevated above surrounding surfaces
PLAN VIEW
Gasoline Dispensing and Service Station
Ground Level
Area elevated above surrounding surfaces serving as dispensing island.

Fig. 1. Plan and elevation views of gasoline service station in which the "dispensing island" is elevated above the ground or driveway level.

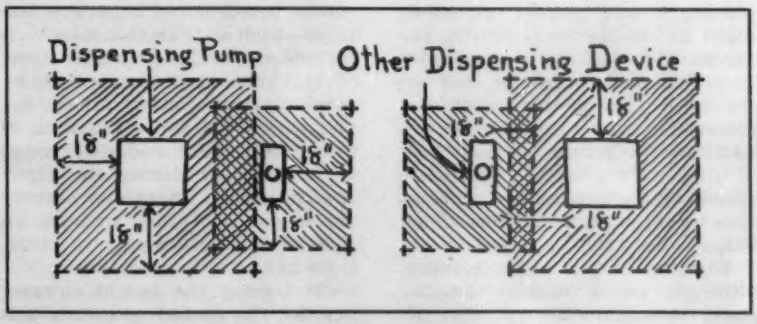


Fig. 2. Where the dispensing devices are not mounted on an elevated island, the "dispensing island" shall be considered as an area extending 18 inches in all directions from the base of each pump or other device.

pumps, etc., these areas may not be adjacent or contiguous, so that a specific dispensing and service station may have many isolated Class I, Division 1, hazardous areas spread throughout the station.

Areas in outside locations adjacent to these dispensing islands or pumps are also considered to be hazardous areas to a somewhat lesser degree. Also the area surrounding a (1) tank fill pipe, or (2) tank vent pipe for volatile flammable liquid is considered to be hazardous. Figure 4 illustrates the classification and extent of these adjacent hazardous areas.

In this diagram it should be noted that one circuit feeding the left hand light standard is extended so as to be entirely outside the hazardous area. The other light standard is within the hazardous area established by the location of the tank fill pipe. For a distance of 18" above the ground or driveway level, the wiring and equipment in the standard is in a Class I, Division 2 area. All the wiring and equipment below this level is in a Class I, Division 1 area.

The extent of the hazardous area near the vent pipe is shown to be localized outside of the building. If windows or doors were installed in this cut off wall then the interior of the building for a distance of 20 feet horizontally from the vent pipe would also be classified Class I, Division 2. All the underground wiring and equipment in this interior area would be classified as Class I, Division 1.

Interior areas

No attempt has been made to show what classifications will be assigned to the interior areas of the building. Section 5105, as stated above, will determine these hazardous areas. But it is quite possible to have an entire room in such an occupancy with the entire area up to a level of 18" above the floor, classified as a Class I, Division 2 location, or even a Division 1 location. In effect three classifications may exist, Class I, Division 1 in an underfloor area beneath the room, or an individual unventilated pit within the room; Class I, Division 2 in the room up to an 18" level above the room floor; and a non-hazardous classification for the balance of the room.

All of the electrical equipment and the wiring located within the various hazardous areas as shown by Figures 1, 2, 3 and 4 must be installed in accordance with the

(*Continued on page 90*)

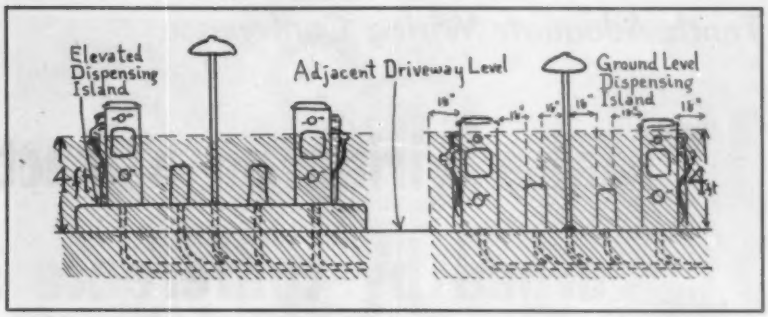


Fig. 3. Classification of hazardous locations on, within, or under a dispensing island: (1) Area of dispensing island shall be considered to be Class I, Division 1 hazardous location (as defined by the National Electrical Code) for a distance of 4 feet above driveway level. (2) Any space within or under the island which may contain electrical wiring or equipment shall be considered to be Class I, Division 1 hazardous location.

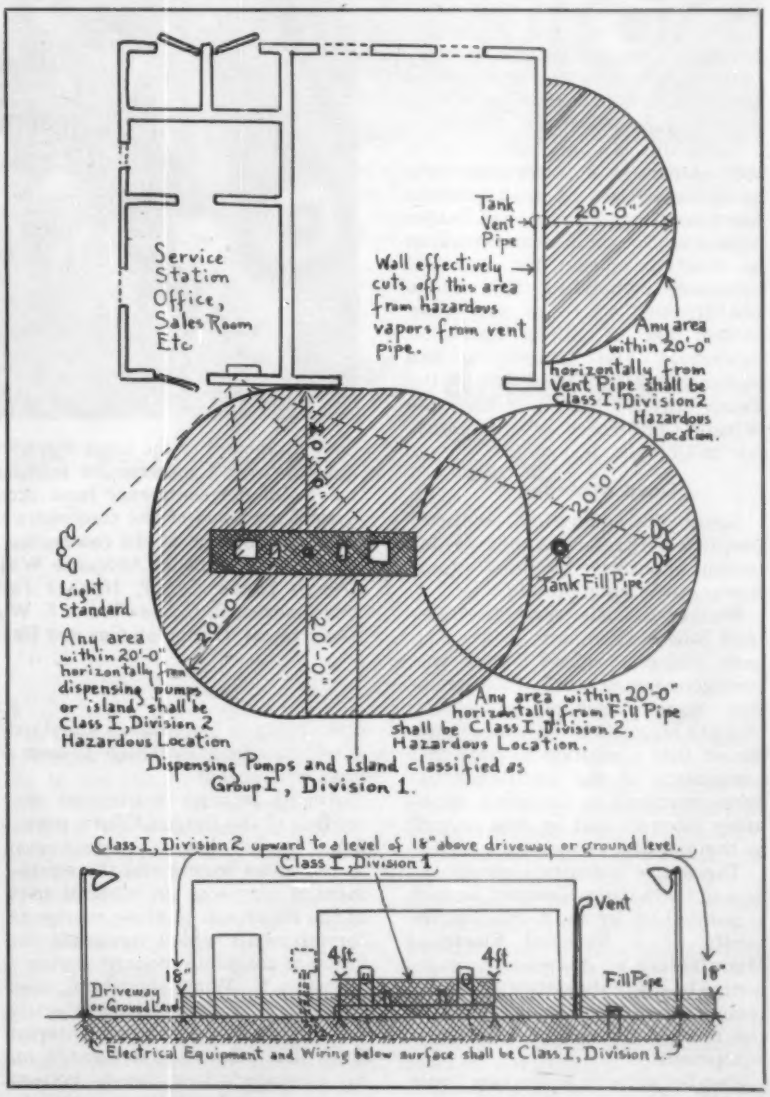

Service Station Office, Sales Room Etc.
Tank Vent Pipe
20'-0"
Wall effectively cuts off this area from hazardous vapors from vent pipe.
Any area within 20'-0" horizontally from Vent Pipe shall be Class I, Division 2 Hazardous Location.
20'-0"
Light Standard
Any area within 20'-0" horizontally from dispensing pumps or island shall be Class I, Division 2 Hazardous Location
Tank Fill Pipe
Any area within 20'-0" horizontally from Fill Pipe shall be Class I, Division 2, Hazardous Location.
Dispensing Pumps and Island classified as Group I, Division 1.
Class I, Division 2 upward to a level of 18" above driveway or ground level.
Class I, Division 1
Vent
4ft.
4ft.
18"
Driveway or Ground Level
Fill Pipe
Electrical Equipment and Wiring below surface shall be Class I, Division 1.

Fig. 4. Classification of areas ajacent to dispensing island with respect to hazardous locations, as defined by the National Electrical Code.

Make wiring an attractive "buy" urged by conference speakers

◆ RESIDENTIAL WIRING modernization must be made an attractive "buy" for the millions of Americans living with wiring that meets 1930 instead of 1954 standards. Lending institutions must give better mortgage recognition where better wiring installations in new housing are concerned.

Until this is done, home buyers will continue to move into new homes which are electrically obsolete from the beginning, and older houses will continue to represent an inactive market for electrical appliance ownership. This theme ran through speeches and open forum talk of utility operation executives and contractor and dealer groups in attendance at the Tenth Annual National Adequate Wiring Conference of the industry in Chicago, last month.

Only a segment of the large attendance at the Tenth Annual National Adequate Wiring Conference is indicated by this photo which takes in only a portion of the conference room occupied by the group. Shown in the foreground are some of the conference speakers. (Left to right) Les E. Barrett, general chairman of the conference; A. R. Hines, chairman of the Executive Committee, National Adequate Wiring Bureau; Walker L. Cisler, president, Detroit Edison Co.; P. Howard Farley, sales promotion manager, NECA, Washington, D. C.; and Frank E. Wiatt, assistant manager of Electric Sales Department, Cincinnati Gas and Electric Co.

Good attendance

Some 300 electrical industry people were present at the two-day session sponsored by the National Adequate Wiring Bureau.

Walker L. Cisler, president, Detroit Edison Company, in his keynote address, voiced belief that emergence once more of the selective cost conscious buyer has brought realization to the appliance dealer that a solution to consumer complaints of the additional expense involved in installing appliances must be met by him as well as the manufacturers.

The entire industry's consciousness of the wiring dilemma, he said, is pointed up by the formation recently of a National Electrical Manufacturers Association committee to study the entire situation, including its effect on expansion of the market for electric utilization equipment.

Parallel activity in the new home field can be seen, Mr. Cisler reported, in the National Association of Home Builders committee now attempting to formulate a standard of wiring adequacy which its members will accept.

Among lending institutions, according to the Detroit Edison president, "a very few . . . have begun to recognize wiring and the equipment it serves as an integral part of the house and to allow mortgage commitments which recognize the value of complete modern wiring."

Frank E. Wiatt, assistant sales manager, Cincinnati Gas & Electric Co., reported widespread interest from this country and Canada on his company's new pay-as-you-go rewiring modernization plan. In this plan, the utility, by purchasing customer promissory notes, finances wiring through a monthly charge on the borrower's electric bill. Utilities, banks, retail chains, and mail order houses have indicated intentions to adopt or adapt similar plans, Mr. Wiatt stated.

Promotion described

Methods by which one of the most successful adequate wiring programs in the country is backed up by sales and promotion efforts of his firm, the local utility, were outlined by M. E. Skinner, vice-president and director of sales, Union Electric Co., St. Louis, Missouri. (See page .... also.)

A new idea in utility sales operation, according to Mr. Skinner, is

M. E. Skinner, vice-president and director of sales, Union Electric Co., St. Louis, described his company's adequate wiring promotion program.

Speaking for the distaff side at the conference were (left to right) Miss Olive Gateley, vice-president of Fuller, Smith and Ross, Inc., Cleveland; Miss Frances Legas, executive secretary, Society of Residential Appraisers; Miss Margaret Perry, supervisor, Home Service Department, Georgia Power Co.

the employment of an architectural advisor by power companies such as his own, to work with builders for reduction of construction costs with improved design or method.

The residential appraiser is the best salesman possible to obtain acceptance from the financial industry of high standards of adequacy, Frances Legas, of the Society of Residential Appraisers, Cleveland, told the conference. She urged use of a new tool, "The Guide to Evaluating Wiring Adequacy in Residences," soon to be distributed by the National A-W Bureau.

Consumer discussed

Other subjects considered were the woman consumer's view of adequate wiring; the National Electrical Contractors Association 1954 promotion plans; the retail appliance dealer's stake in adequate wiring; a farm wiring panel, featuring industry, education, and REA Co-operative representatives; a Kansas City, Missouri, electrical contractor's success story on residential wiring modernization; and an educational session for newcomers in the electrical industry adequate wiring field.

Following are excerpts from some of the principal talks given before the Conference.

Success of A-W depends on contractors support

by Harry De Poy

Manager, Central Wisconsin A-W Bureau

◆ WE ARE ALL AWARE of the fact that the electrical contractor is the key man in selling Adequate Wiring to the public. If he is pulling with you, your sales ranks are solid. If he is against you, your sales and advertising efforts are wasted.

Then "Getting and Keeping the Electric Contractor Interest" is one of the most important jobs we have to do. I hope to show you one practical way you can do it; a way that has been successful for us and will be for you. Of course, the success of any plan depends upon the men who use it—men who have ideas, enthusiasm, push, and, if possible, promotional and sales experience.

Because getting the contractor's interest is a sales problem, our solution must be based on sales principles.

We must know our product — know it in terms of advantages and benefits it will bring the contractor. Our approach varies with the type of prospect, but there is one fundamental in selling that never varies: sell the advantages and benefits and not how the product is made.

Determine his needs

We must know the contractors need for our product.

We must know how our service or product fills those needs.

Let's start with "What are the contractor's needs?"—"What would

he want us to do to help him?"—"What is it he is most interested in?" Isn't it more profits and better customer relations? Every good businessman is interested in more profits and better customer relations and most of our contractors are good businessmen. When you can show him how you can increase his profits and improve his customer relations with no cost to him but his co-operation, don't you think you can get his interest?

You can, and it is not very difficult because the National Adequate Wiring Bureau will provide you with all the tools necessary to do it and are always standing by to help you in every way they can. I am not going to take the time to tell you what they are or how to use all of them, as they are in the booklet, "How to Develop Your Plan of Action for Adequate Wiring Promotion." I do want to tell you about one—the one you can use most effectively in getting contractor interest. It is Adequate Wiring layouts and personnel to sell Adequate Wiring to the contractor's customers. This is the product that you are going to use to fill the contractor's need we spoke of—more profit and better customer relations.

Presenting program

You present it something like this:

"We will pick up the building plans when you get them and make Adequate Wiring and Light layouts. We will make prints of these layouts for you and your customer and you can use them to sell your customer on a more adequately wired home. At first, you may not be able to sell all that is shown on the plans but at least what they should have will be shown for you and your customer's consideration.

"You will find that gradually you will be able to include more and more of them in your jobs and you will be making more money and your customers will be better satisfied with their wiring. We don't believe you have had the time or personnel to make these layouts. Wouldn't it make it much easier for you and your customer and save you a great deal of time and work if you had a wiring layout to work with when discussing the job with them? When they finally decide on what they want we will make you corrected prints. You will have a copy for your workmen and the customer will have a copy. You will know just what you are to do and your customer will know what he is to get and there will be no chance for misunderstandings.

"Or, if you wish you may tell your customer that you will have a preliminary wiring layout made and someone will call and go over it with them to help them decide what wiring and lighting they will want in their new home. We will have men who are experienced in selling adequate wiring and lighting do this job for you. They will fill a gap between you and your customer that you have had neither the time nor the personnel to fill. These men will have the time and the training to do a good selling job and remember when they are talking to your customers they are working for you. They will go over the entire layout with the customer, making suggestions and recommendations where necessary. When the final layout is decided upon you will find that you will have a well satisfied customer and a job that will make money.

"To prevent underbidding, we will tell the customer that you have a reputation for giving fair bids and warn them against someone cutting the job to give a lower bid and to insist on the job being done as shown on their final layout. To cut the job would not save them money, but only make a larger expense later on—plus the dissatisfaction that goes with inadequate wiring.

"To create a public demand—we will advertise this free adequate wiring layout service and the advantages of adequate wiring and lighting both on radio and in the newspaper. Our advertising will be directed to the owner of old homes as well as new homes. We will have booths at the Home Builders show and the Fairs showing the advantages of Adequate Wiring and offering free adequate wiring and lighting layout service. We will have promotional material available at these showings to give to the public.

"We will actively promote adequate wiring and free layout service among building contractors, architects and financing institutions. We will place handout literature in your shop and keep you supplied.

"All our time and efforts will be used to sell adequate wiring and lighting and as a result you will find that those who come to you for bids have realized the importance of having an adequately wired home and know that to have a home wired, on a price basis only, is unwise. Your job will be much easier.

"It has been proven that where this plan has been followed that the electrical contractor receives a larger per cent of the building dollar and as a result an increase in profit and the home owner becomes a booster because he is enjoying the comforts, convenience and economy of an adequately wired home, a home wired for Electric Living and you will receive the credit."

Contractors urged to tap rich farm wiring market

by H. H. Watson
General Electric Company

◆ MANY OF YOU who have long been concerned with the lamentable condition of wiring on the American farm and in the farm home have arrived at the point where any further discussion of the subject is not much more than deep breathing exercise. Fortunately, however, there are a few courageous individuals whose interest remains vigorous enough so that the farm wiring problem is kept before us. So forceful have become their protests in recent months, that when the program for this two-day conference was planned a panel session on farm wiring and what can be done about it was

Where vibration, motion or shock loosen connections . . .

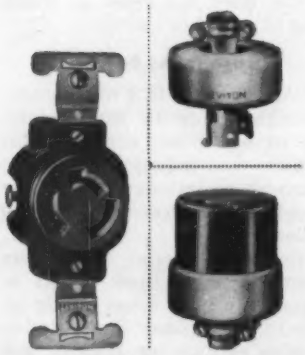
USE LEV·O·LOCK DEVICES

for UNINTERRUPTED POWER FLOW

Just a turn of the cap makes a secure connection that will not shake loose . . . that will provide safe, dependable electrical connections under severe usage. *LEV-O-LOCK* devices incorporate every up-to-date advantage in engineering design, made available by Leviton's half-century experience as leader in the wiring device field.

Contacts are double wiping type in all receptacles, and are made of heavy gauge phosphor bronze; extra large terminal screws and ample wiring room provided; quality controlled mass production assures accurate alignment of blades.

Send for bulletin LL



LEV-O-LOCK devices are available in 2-3-4 wire caps, connectors and receptacles in 10 and 20 Amp ratings. Approved by Underwriters' Laboratories.

LEVITON MANUFACTURING COMPANY

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included in the conference schedule.

Unlimited potential

Farm wiring historically and traditionally is a disgrace to the electrical industry. It is true that 93 per cent of all farmsteads have electric service available to them . . . that the kwh consumption looks reasonably good. But America's average farm investment of $20,000 of capital per farm worker is shackled by horse and buggy electric distribution on the farm and in the farm buildings. The wiring on our farms is little more than copper cobwebs. The potential modernization market for labor and materials has been estimated at $2,000,000,000 for the 5,000,000 wired farms as compared to the same figure of $2,500,000,000 for the 42,000,000 wired homes in this country. This means broadly that the American farm is 8 to 10 times as poorly wired as the American home if these figures can be reduced to such a numerical comparison.

Mailing impossible

When we attempt to prepare mailing lists to reach those people who install farm wiring as a business, we end up chasing our tails. When we ask at farm meetings, who should do farm wiring, the farm boy?, the local handyman?, the farmer?, or an electrical contractor?, we get a substantial consensus that it should be a contractor . . . this, mind you, from farmers who initiated the "Do it Yourself" movement just after the Mayflower discharged its load of Pilgrims. With all the honest and sincere respect I can summon up for the energy and aggressiveness of the electrical contractor, I must report factually that he has bypassed his farm wiring modernization responsibility and opportunity. There are good reasons for this condition of course.

Farmer desires service

The farmer is no longer a day laborer toiling behind a horse and plow. He is a businessman with a large investment in production equipment. He has a keen sense of values and an alertness for improved methods and materials. He now uses electricity . . . lots of it . . . he wants to use more and more for an ever increasing list of applications. But up to now, and I think I can speak for the entire electrical industry at the National level, we have not honestly, diligently and intelligently performed for the farmer the service that long ago was rendered to the manufacturing industry when we developed an acceptance for good factory wiring.

Challenge to contractor

The challenge here I think is particularly to the electrical contractor. Wiring materials are available, well designed and produced in adequate quantity. The manufacturers are developing and producing an ever increasing stream of power consuming equipment. The farmer, pinched by increasing labor costs and labor shortages is an eager customer. The utilities welcome the farm load. Banks still have the dollars for financing. It remains only for the contractor to come in to do his share of the job. In this game everybody wins, the manufacturers, the utility, the contractor and most certainly the farmer.

A-W promotion integrated with economists' services

by Miss Margaret Perry
Home Economist, Georgia Power Co.

◆ I REPRESENT a department of my company numbering 51 home economists, a few of us in specialized capacities, but all of us concerned with direct contact with our half a million residential customers in their homes and in groups.

We are a part of the Sales Department, although we take comparatively few sales orders. Our responsibility is to sell electrical living. Since we follow a very wide program of work, we are not able to do nearly as complete a job of any phase of it as we hope to be able to do when our staff can be increased in number.

Planning service

One of the most important phases of our activities is our advisory and planning service to customers on wiring, following adequate wiring specifications. Each girl receives specialized wiring training during her regular training period before going into her territory. This training is continually supplemented in the field.

Last year on individual calls, company-wide, we reported some wiring information given to 16,643 customers of the 42,133 on whom home calls were made.

We reported wiring plans presented to 719 customers in 1953. In addition, we presented 2,038 kitchen plans and 511 laundry plans, all of which included wiring and lighting layouts. We serve only in an advisory capacity, but we know that many of these plans were followed completely. Only in Atlanta where we have an Adequate Wiring Department staffed by engineers do we offer certification.

On many contacts, we have been able to do nothing toward getting adequate wiring into new homes. G. I. loan houses in our area are built according to absolutely minimum standards. FHA houses, built and then sold, in general, are inadequately wired. A great majority of houses built several years ago need several added circuits. Sometimes an electrician himself will tell a customer whose wiring we have planned for her new home that she does not need as much wiring as our plan specifies.

Future looks better

However, there is a much more encouraging side to the picture. Many of our plans are done for customers who request our help on the recommendation of customers with whom we have worked who are pleased.

Some builders and contractors recommend us to their clients as being able to help them decide on details of their plans. Some architects also call us for help or ask their clients to let us help them make some decisions.

We receive other leads as to who

now available

from FA distributor's stocks for quick assembly on the job

FA T-M thermal-magnetic trip circuit breaker

LOAD CENTERS and SERVICE EQUIPMENT

Approved by the Underwriters' Laboratories, Inc., for label service, these new FA assemblies embody many features that should make them extremely popular with contractors, and builders, as well as ultimate users.

Besides providing safe, dependable, automatic circuit protection against short circuits and harmless and dangerous overloads, these new units are so designed to make the addition of new circuits, changes in capacities and replacement of damaged units a simple, easy task.

Deliveries, too, are facilitated due to the fact that the new units are of the "panel base assembly" type, which means that all components — box, front, panel-back, bus bar and main lug connection — are available in one complete package from FA distributor's stocks for quick and easy assembly on the job.

An outstanding feature of the new unit is the new FA T-M Thermal-Magnetic Trip Circuit Breaker with quick-make and quick-break operation on manual or automatic trip and FA design magnetic blow-out.

The thermal magnetic action of the circuit breaker automatically trips the handle, indicating the circuit in trouble. Service interruptions caused by harmless, momentary overloads are eliminated, due to the time-lag action of the circuit breaker's thermal element.

On short circuits and dangerous overloads, the magnetic trip hastens the action of the circuit breaker. Once the cause of the trouble is removed, service is restored by flipping the handle back to "off" position and then to "on".

Screwless assembly (just slip the breakers in), one pressure type of connection between circuit breaker and bus bar, and "sequence bussing" to balance the load and permit double pole, individual trip combinations are other features.

Four basic combinations to afford a maximum of 4, 8, 12 and 20 poles (all single pole or combinations of single and double pole) are available. These, plus a supply of dependable, individually-packed single and double pole individual trip FA type T-M Circuit Breakers, available from distributor's shelves, meet almost any job requirement.

For contractors and builders, these new FA assemblies all add up to greater convenience, faster deliveries, and quick and easy installation on the job. So include these units on all jobs requiring Load Centers and Service Equipment. For further details, see your nearest FA distributor, or contact a FA representative, listed in Sweet's.

FA **T-M Circuit Breakers** are available in the following capacities: 10, 15, 20 and 30 amps., 120 volts AC single pole and/or 120/208 volts AC double pole individual trip; 40 and 50 amp., capacity furnished with FA QP Quicklag P Circuit Breaker; main lugs for 100 amp., maximum, 115/230 volts, 3-wire single phase of 120/208 volts, 4-wire three phase mains. (Six circuits or less suitable for service equipment.)

Frank Adam Electric Co.

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ST. LOUIS, MISSOURI

Makers of: BUSDUCT • PANELBOARDS • SWITCHBOARDS • SERVICE EQUIPMENT • SAFETY SWITCHES • LOAD CENTERS • QUIKHETER

needs us in various ways. New homes being built in their community are reported to us by personnel in some of our local offices. Sometimes the local manager has already sold our planning service to the customer in such a way that we can proceed with a minimum of preliminary discussion.

Many of our wiring calls are made on cold contacts, after we have received information from a building information service to which our Company subscribes, from our investigations after having seen a foundation being laid or materials being delivered on a lot. On many of these calls, we are welcomed because of our identity. Since our department this year is celebrating its silver anniversary, many of our customers have become familiar with us as service employees, whether they know that we offer wiring planning services or not. The fact that early in the explanation of our service we assure the customer of its being on a no charge basis also helps.

Service develops talk

Actually, most entries into wiring discussions develop from other services we give:

(1) We check with the customer on whether or not she knows how to replace blown fuses, regardless of the original mission in her home. Demonstrating to her how to change a fuse and recommending proper amperage almost has to go into a discussion of circuits and wire sizes.

(2) We demonstrate new major equipment sold by our Company as well as by dealers, also checking on the use of other large and small equipment in the home. Instructions in proper use of it often must include some wiring recommendations, with an explanation of why.

(3) We try to find which electrical appliance is next on the list for use by the family, often in this way being able to develop a definite prospect to be referred to the territory salesman. Information on proper location of the appliance is usually necessary here, which leads easily into a discussion of wiring needs.

(4) We are also home lighting advisors. In doing this work we repair old lighting equipment and sell new pieces. In proper connection of these, added wiring often must be recommended.

(5) We plan kitchens, laundries, and lighting in new and remodeled homes. Wiring planning is inseparable from these, of course, and wiring and lighting layouts are included in each plan.

(6) Occasionally we receive complaints of equipment not working well, or bills seeming too high. In many cases extension cords are used for connections and there are too few circuits, resulting in inefficient and more expensive use of equipment.

Future use explained

On new house planning work, we approach the discussion from the standpoint of present and future uses of electricity. The home maker knows what equipment she is using now and what she expects to use in at least the near future. Usually she has had the experience of fuses blowing from overloading of circuits, of lights blinking when motors turn on, of having clusters of plugs from which extension cords emanate. She wants to eliminate the unattractiveness and inconveniences of these situations in her new home. Actually about the only objection that we receive is cost of installation of an adequate wiring system. We concentrate on getting the customer to provide an adequate service entrance, with provision for spare circuits to be added in a step by step process as necessary, if adequate wiring cannot be installed at first.

We know now that the younger generation has more to do with influencing improvements in the home than at one time. Each year we contact each school home economics department on our lines, surveying its facilities and needs, offering information which can help the teacher, and offering one demonstration during the year to the department. This year in my division, we have been encouraging teachers to let us do wiring demonstrations, as the teachers never feel qualified to teach wiring. One demonstration, of course, can serve only to encourage interest toward learning more.

School aid sought

We hope after this year to be able to get more wiring information across to home economics students through the vocational agriculture teachers.

Last summer, one-half of the vocational agriculture teachers in the state attended short courses held in the four vocational districts of the State. These were initiated by our Georgia Power Company Rural Engineering Department and sponsored by the Vocational Education Department of Georgia. This time was divided equally between instruction and practical wiring experience. Next summer, the other vocational agriculture teachers are to attend the courses. These men are teaching their high school agriculture classes how to install wiring. Many of these youths are seeing that wiring in their homes

Other principals attending the conference and participating in discussions were (left to right) A. W. Bernsohn, managing director, National Appliance and Radio-TV Dealers Association; Lester D. Olin, director of appliance merchandising, "Ladies Home Journal"; Emerson Dole, NARDA director; R. E. Lieb, promotion manager, North Central Electrical Industries, Minneapolis.

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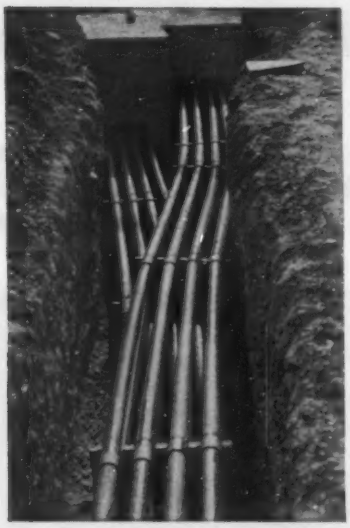
Quality stands out in every feature. Tough, resilient, non-metallic... Orangeburg Fibre Conduit does not easily crack or break. Its impermeable walls and tight joints keep out corrosive ground waters. Its smooth bore and low coefficient of friction protect cable sheaths from abrasion. Orangeburg material resists acids, alkalies, salt, grease, oil.



ORANGEBURG STANDARD is installed with concrete encasement. Preferred for banks of three or more ducts. It has installations in service over 60 yrs.

For these and other advantages Orangeburg provides complete security for electrical services underground. Result... no interruption of power. These vital services keep flowing.

SAVES MONEY, TOO!

Saves by prolonging cable life . . . by faster and easier handling, tooling and laying . . . and by the use of Orangeburg's standard fittings. They cut costs by simplifying installation.

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ORANGEBURG NOCRETE is installed without concrete encasement. Extra heavy wall for direct burial—practical for many single or double duct runs.

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GENERAL ELECTRIC SUPPLY COMPANY
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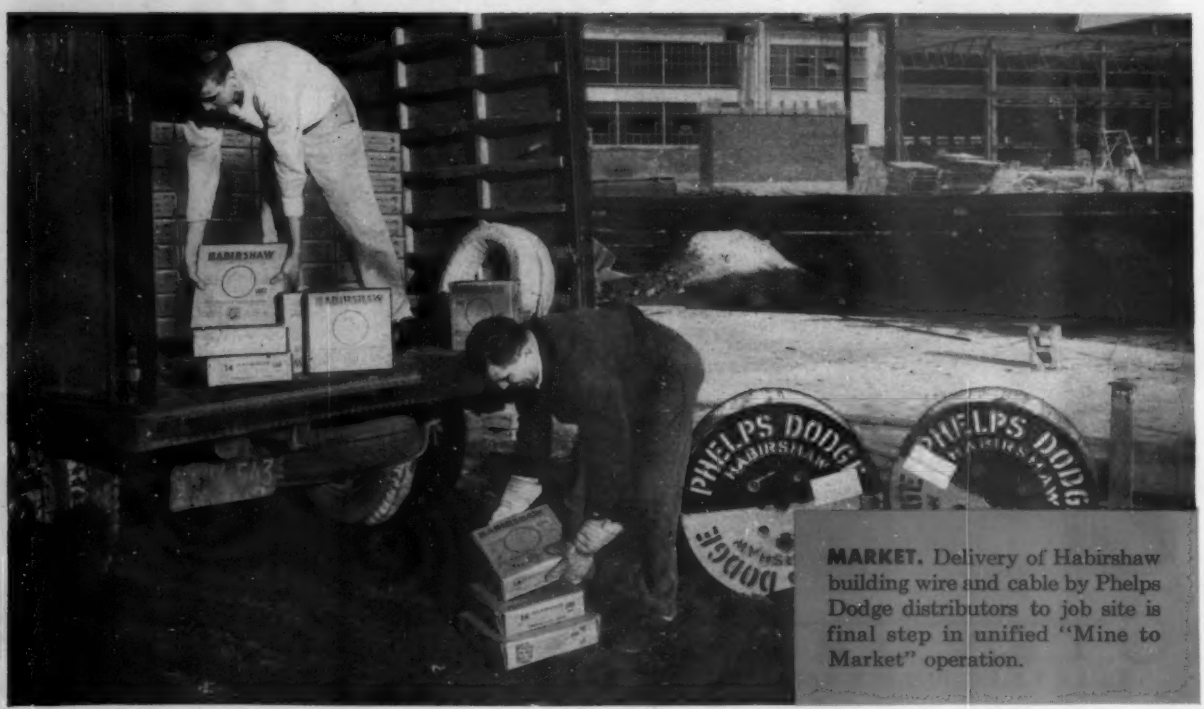
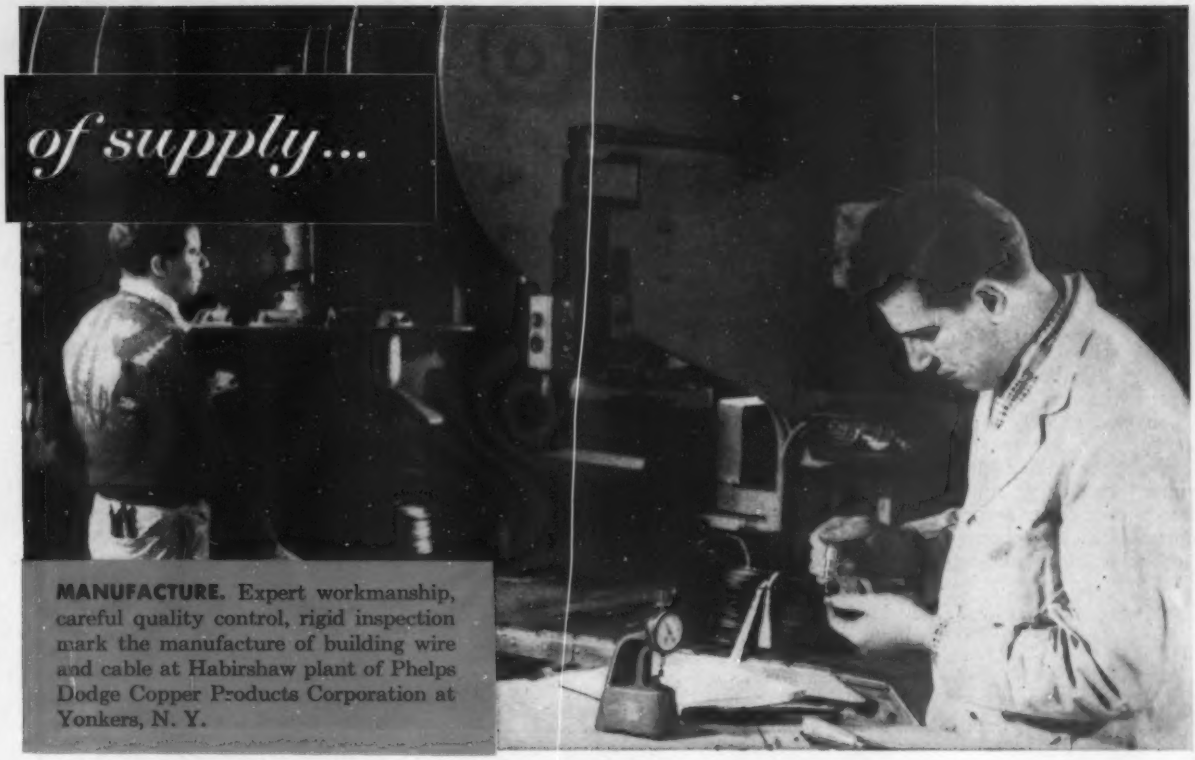
When you need a dependable source

MINE. Habirshaw building wire and cable start in vast Phelps Dodge open-pit copper mines like this one at Morenci, Arizona.

IT PAYS TO SEE A PHELPS



MARKET. Delivery of Habirshaw building wire and cable by Phelps Dodge distributors to job site is final step in unified "Mine to Market" operation.



MANUFACTURE. Expert workmanship, careful quality control, rigid inspection mark the manufacture of building wire and cable at Habirshaw plant of Phelps Dodge Copper Products Corporation at Yonkers, N. Y.

DODGE DISTRIBUTOR!

Phelps Dodge's complete "Mine to Market" program assures distributors dependable supplies and service

Here's what "Mine to Market" means to you:

1. ***A CONSTANT SUPPLY OF RAW MATERIALS.***
2. ***HIGHEST QUALITY WORKMANSHIP.***
3. ***PROMPT DELIVERY—all from one major source.***

Phelps Dodge distributors are an integrated part of this system, profit from working closely with a primary copper producer and fabricator.

PHELPS DODGE COPPER PRODUCTS CORPORATION

WIRE BY PHELPS DODGE MEANS WIRED FOR LIFE!

is adequate, and many of them, where there are no electrical contractors, are actually doing the wiring themselves.

We have found at least one school in our division where the agriculture and the home economics teachers are planning to exchange students for a week. The agriculture teachers will teach a wiring unit to the girls while the home economics teachers will help the boys with table manners and other social graces. As we make further school contacts in our division, we hope to encourage this pupil exchange to good advantage.

Our particularly big problem is homes built several decades ago, or perhaps not so long ago, in which practically no wiring has been added, but in which more and more electrical equipment is being used. In many of our small towns and rural areas there is no electrician, so that getting someone to do electrical work is a problem. Perhaps the answer is in getting the man of the family sufficiently interested to analyze the wiring situation in his home and to learn enough to make some simple wiring improvements himself.

The results of our attempts at adequate wiring education sometimes seem very meager, but often when we feel most discouraged, there will come a repeated expression of appreciation from a customer whose home we have helped to plan and who still would make no change in her kitchen or wiring, even after years of having lived with it. Then, we realize again how important our service is and we are inspired again to keep using every effort to spread it as widely as possible.

Home shows are valuable A-W promotion aids

by H. K. Keller
Indianapolis Power and Light Co.

◆ FIRST OF ALL, I should like to take the liberty of changing the wording of the subject as announced from, "Using Home Shows to Promote Adequate Wiring" to "How We in Indianapolis Have Used Home Shows to Promote Adequate Wiring." I propose to simply tell you what we have done in the way of using home shows to promote adequate wiring and what the apparent results were so that each of you can decide for yourselves whether any of our methods could be applied to your local situations.

Secondly, I would like to define for you what I mean by the words "home show." A home show to us means the exhibition of a completed house to the general public for a reasonable period of time by the means of a planned and publicized program. This definition as you can see infers that home shows are the result of careful planning and a lot of work, and if successful, they are.

In preparing for this assignment it became apparent that three major questions were involved. (1) Are home shows good media for adequate wiring promotion? (2) What promotional methods have we used? (3) What have been the results?

Quality of media

First, are home shows good media for adequate wiring promotion?

Well planned and publicized home shows are well attended by the public. For example, the annual Indianapolis Home Show attracts approximately 80,000 people each year during its 10 days showing. With approximately 60 per cent of the families in the Indianapolis area owning their own homes, we know that a large portion of these 80,000 people are most definitely interested in improving their own homes, or are filing away ideas for future homes. In fact, one of the primary reasons people go to home shows is to get ideas and see what's new in appliances and home conveniences, and this provides us with a conditioned and receptive audience.

In studying market saturation figures as of 1953 for our own area on just a few of the electric appliances ordinarily found on display in home shows, you will notice that these appliances need some special wiring above the minimum code job if they are to give the user the maximum of satisfactory trouble-free service.

The market in our area on these rather common appliances has not even been scratched. And so as the people see these appliances at the home show and decide that they want them for their own homes, we can't afford not to be at the home show promoting adequate wiring. The home show is the ideal medium for selling an idea because after all, that's what most of the people are there to look for anyway. In my opinion, then, the answer to question No. 1 is "yes" — home shows are good media for adequate wiring promotions.

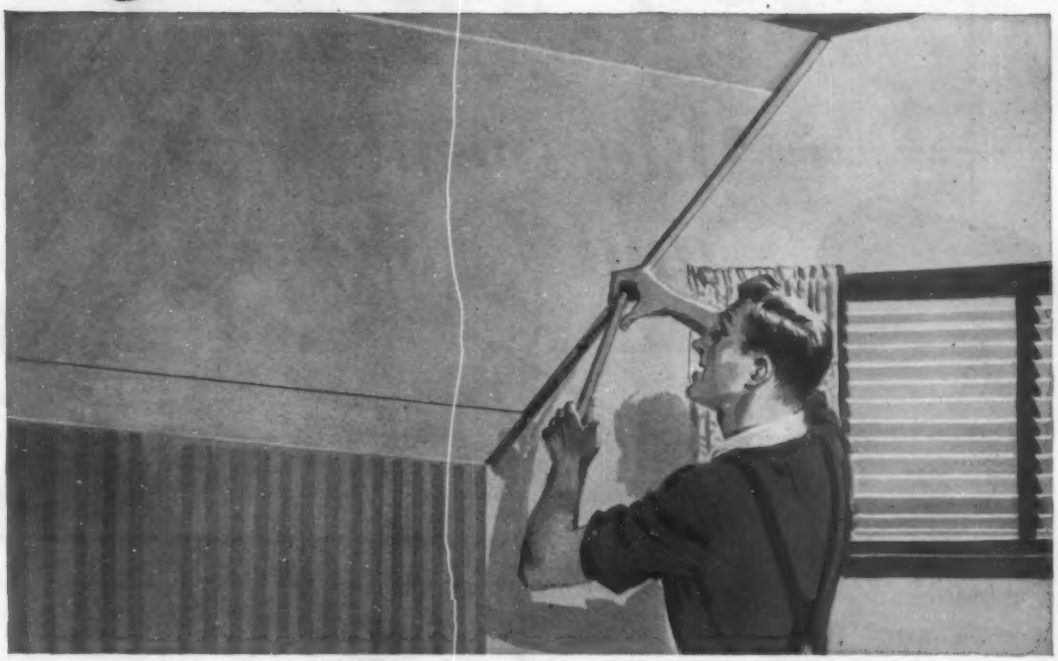
Now, let's take up Question No. 2, "What promotional methods have we used?"

Developing show plan

There are several ways to use home shows to promote adequate wiring, but we have more or less established the following pattern. As soon as the architect for the display house is announced by the Home Show Committee, we immediately contact him. We sell the architect on the advantages of including an adequate wiring layout and specifications with the plans of the home. The next step is to contact the electrician. For safety reasons and to prevent people from turning lights on and off while they go through the house, all of the permanent lighting is controlled by an external master switch. This makes it necessary to follow-up with the electrician and have him install dummy switches and convenience outlets for those locations on the plan that do not have to be "hot" during the show. We even talk him into putting in false service entrance equipment of the proper size for the load that would be in the house if everything were connected and operating, whenever possible.

The next step is to design and exhibit for our own booth which will tie-in with the display house. We believe it is important to gain

High in Profit... low-cost electrical radiant heating



U.S. Rubber's USKON® ceiling panels put you in the heating business

What does USKON mean to the Electrical Contractor?

FIRST, it can be quickly and easily installed—the panels *now* can be applied in sheet form to existing ceilings. No extensive wiring or alterations needed. A minimum of trouble and time for you. It keeps your costs down.

SECOND, Uskon is a proven seller. With Uskon the homeowner knows he can heat his house as it grows; when he wants to finish expansion attic, he merely orders some more Uskon panels from you. This is truly the heating system that fits everybody's needs and offers you repeat business.

THIRD, Uskon is a product of United States Rubber Company. It has been tried and proved for several years with complete success in homes, apartments, offices, expansion attics, commercial and industrial buildings, bathrooms, sun porches, game rooms, garages, basements, motels, summer cottages. Uskon has revolutionized electrical radiant heating!

Everybody wants USKON electrical radiant heating! Architects like the freedom of design it gives them—no radiators, furnaces, pipes, ducts, and so on. Decorators like Uskon for the same reason, plus the fact that it can be painted over with any ordinary flat paint.

Home Owners prefer Uskon because it costs less to install than almost any other kind of heating—and because it gives quick heat with a switch or thermostat. Uskon can be installed in one room or in all rooms; completely eliminates every kind of nuisance found in ordinary heating systems. Approved by Underwriters' Laboratories, Inc.

As an electrical contractor, you will find Uskon electrical radiant heating to be one of your most profitable items. It is made by United States Rubber Company, a great name known for quality products everywhere—a name that helps you sell. For complete technical data and cost information write for Catalog M3177, Mechanical Goods Division, United States Rubber Company, Rockefeller Center, New York 20, N. Y.

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To withstand physical abuse, moisture, sun and oil, use Tiger Brand Amerclad for all sorts of portable equipment.

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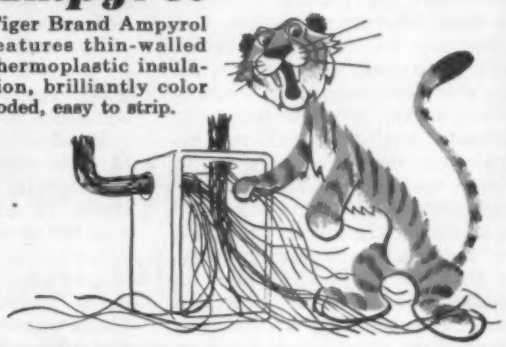
Submarine For underwater power distribution, there's a Tiger Brand Submarine Cable to withstand any operating condition.

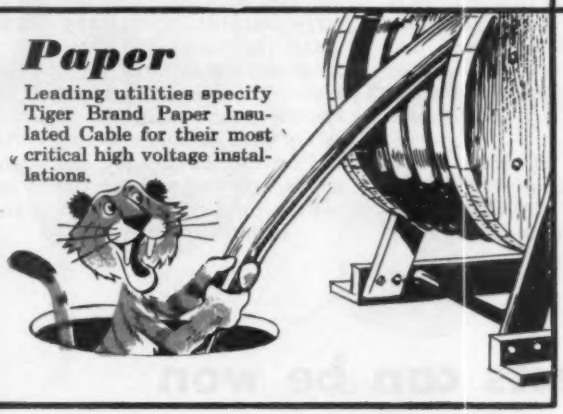
Ampyrol

Tiger Brand Ampyrol features thin-walled thermoplastic insulation, brilliantly color coded, easy to strip.



Paper

Leading utilities specify Tiger Brand Paper Insulated Cable for their most critical high voltage installations.



American Steel & Wire *specializes* in wire and cable that must withstand abusive service. No matter what kind of operating condition you may have, there is probably a *standard* Tiger Brand Wire or Cable that will give you better service than you ever dreamed of.

Send the coupon and outline your problem. We'll see that you get service—*fast.*

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
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Cleveland 13, Ohio

● Please give me more information about Tiger Brand Wire & Cable for .....

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U·S·S Tiger Brand ELECTRICAL WIRE & CABLE USS

UNITED STATES STEEL

the advantage of identifying ourselves with the general theme of the show whenever possible.

One year we received the architect's permission to reproduce his floor plan (remember now we have already talked him into using our adequate wiring layout on his plan) and constructed a series of 4 large backlighted shadow boxes which showed the wiring and lighting layout for the house. The booth was constructed in such a manner that the people had to walk through it to get to the exhibition house. The thinking behind this arrangement was to give the people something to look at while they were waiting to get in the display house with the hope that they would compare the shadow box layouts with the actual house.

For one year there was a handout piece done in the colors of the official home show program. Wiring and lighting were the most prominent stories in this handout. Last year our company's over-all promotional theme was "electric living," so we made sure our advertising department worked in the wiring story in the copy prepared for our handout piece, and in the stuffers inside of the jacket.

Stick to show theme

As I mentioned before, we try to identify ourselves with the main home show theme whenever possible and so this year our display will be something along these lines. The home show architect will use a "4 Star" theme—the four stars of good homes being: good design, construction, craftsmanship, and materials.

We are going to use the same theme but adapt it to electric living. The first star of electric living will be adequate wiring and we intend to develop the story that adequate wiring is the heart of the home.

Perhaps the most ambitious of the open house type of home show we have undertaken was the "four degree" program of 1949. We were co-sponsors with the Better Homes Bureau of Westinghouse Electric Corporation in this promotion which featured the four degrees of electric living. The major objective of this program was to exhibit to the public, so they could inspect and compare, four different new homes, each completely furnished and equipped, each in a separate price bracket, and each demonstrating electric living in a varying degree. Four builders agreed to cooperate in the program and the planning began. As the houses progressed, advance advertising by newspaper, radio and TV told the public what we were doing so that by the time we were ready for the grand opening there was already considerable public interest.

Handout pieces were developed to give each visitor, which very prominently displayed the wiring story. In addition, Westinghouse supplied us with literature that was designed to show the visitors the reason why modern electric living needs planned adequate wiring. There was one other gimmick used that attracted a lot of attention to the wiring in the houses. This was the lighted shadow boxes that showed the floor plan of the house, and by pressing a button the visitor caused the wiring layout to appear on the floor plan.

Another type of home show which is becoming a very important annual affair is the Parade of Homes. One of the things we have done in this promotion to attract public attention to wiring is to offer to the builders who are displaying houses in the local Parade of Homes, and who have installed adequate wiring, a handout piece to give his visitors.

Another type of home show we co-operate in is the "Light Conditioning" program. We make it a part of our contract with the builder that he must install adequate wiring in order to be eligible to participate in the promotion. Then, when we show the house we call attention to the wiring by displaying the certificate and by use of large placards strategically placed about the house. We also furnish large signs that carry copy as follows: This home is planned for electric convenience, efficiency, safety with adequate wiring certified by Electric League of Indianapolis, and with ample space at the bottom for both the builder's and

(*Continued on page* 91)

Architects can be won to the A-W program

by L. J. Lessenich
Wisconsin Power Co., Milwaukee

◆ I HAVE BEEN studying the history of our dealings with architects in Milwaukee. We do not feel that we have been too successful in convincing the majority of them that they owe it to their clients to specify adequate wiring in their plans. In the few instances where results have been satisfactory, we find that our mission was accomplished—usually over a long period of time—by applying the teachings of Dale Carnegie, Elmer Wheeler, and others who advocate the use of good, common horse sense.

Aid the architect

"Be Helpful" has been our motto. It is our means of winning the confidence of the architect and his associates. In being helpful, we (1) issue orders for furnishing electric service to his clients, (2) handle negotiations for line extensions, (3) learn about his interests, (4) become familiar with his technical terms, (5) understand his problems.

The friendship of the young designers in the architect's office is particularly sought. They are learning the profession and need help. The assistance and information we offer is welcomed by them and, once the adequate wiring story is understood, they make satisfactory layouts and write proper specifications.

It is easy to gain the enmity of an architect. We take great pains to avoid ruffling his feathers. If his client brings his house plans to us for a review of the wiring plan, we check with the architect and obtain his approval before we proceed with any recommendations for changes. By doing this, we have built such good will with some of the architects that they call on us for help when they need it.

NOW....keep wiring really liquid-tight with *NEW* T&B Connectors for liquid-tight flexible metal conduit

Seal out all moisture, oil, and corrosive fluids with this easy-to-install, self-grounding connector . . . a connector specially designed by T&B for Types UA and EF (J.I.C. Standard) liquid-tight flexible metal conduit.

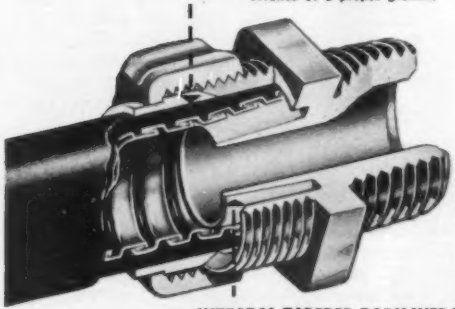
Just push conduit into connector body and take up on gland nut until blue plastic ring appears. No need to disassemble connector. No twisting of conduit. Same wrench fits both body and gland.

Integral tapered body wedge positively grounds metal conduit armor. Plastic-to-plastic seal between gripping ring and conduit jacket makes tight leak-proof connection. Straight connectors, 45° and 90° elbows available for conduit from ⅜" to 2".

Send for sample and engineering data today.

PLASTIC GRIPPING RING

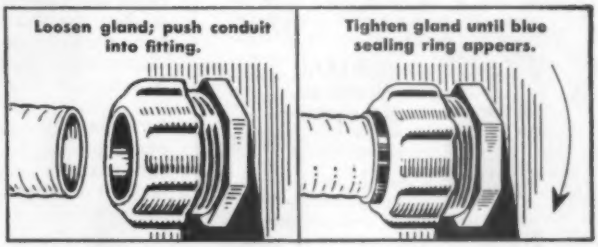
- Seamless, pliable, oilproof plastic forms perfect seal with plastic conduit sheath.
- Protects conduit sheath against damage.
- Blue color gives visual installed insurance of a proper ground.



INTEGRAL TAPERED BODY WEDGE

- Positive ground for metal conduit armor.
- Fits all thicknesses and convolutions in standard liquid-tight flexible metal conduit.
- Grounding member integral with body.

A CINCH TO INSTALL—



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The complete line of T & B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs. T328

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PARKERSBURG, W. VA.

Free bulletins

available to our readers

The latest selection information on **motor starters and pushbuttons** is contained in a new publication announced as available from the **General Electric Co.**, Schenectady 5, N. Y.

Designated as GEA-6061, the six page, two-color bulletin provides buying information on a-c magnetic motor starters (1/6 to 50-hp), a-c combination starters (½ to 25-hp), pushbutton stations, a-c manual motor starters, and magnetic reversing controllers. In addition to rating and suggested prices, the publication contains photos of the equipment, circuit diagrams, and brief application data.

"A Quick Break Interrupter Switch", a new booklet just released by **Delta-Star Electric Division**, H. K. Porter Co., Inc., 2437 Fulton St., Chicago 12, Ill., describes the company's new Type "QB" device in various positions of operation on different types of air switches. Enlarged views from a movie film, taken at 190 frames per second during a field test, clearly illustrate the nature of the arc interruptions. Also shown are the results of an ice test with the switch closed and opened.

The booklet is concise and complete from Introduction to Summary, including a table of tentative interrupting ratings for the Type "QB" air switch attachments. Copies are available upon request.

Control Centers by Clark, a colorful, 24-page, illustrated booklet issued by **The Clark Controller Co.**, 1146 East 152nd Street, Cleveland 10, Ohio, describes the many advantages of centralized electrical control systems through use of their A.C. Motor Control Centers. Typical installations, specifications, construction details and helpful planning tips are also featured. Invaluable reading for plant, project or planning engineers and plant layout departments, the booklet is available from the company on request.

A quickly visualized chart of **electrical and mechanical features of standard and special motors** is offered by Brook Motor Corp., 3555 W. Peterson Ave., Chicago 45, Ill., to facilitate selection of the right motor for the job.

The selection guide is a feature of a new and fully illustrated catalog issued by Brook on its line of 1 to 50 hp AC motors. The Brook line includes two classifications of AC motors—single phase capacitor and the polyphase squirrel cage. Each group includes open drip-proof motors, splash-proof motors, totally enclosed non-ventilated motors and totally enclosed externally fan-cooled motors.

The Chicago firm is a subsidiary of Brook Motors, Ltd., of Huddersfield, England, manufacturers of AC motors exclusively. All models offered to the U. S. market meet or exceed NEMA standards for frame sizes and dimensions, horsepower ratings service factors temperature rises and other performance characteristics.

All Brook motors have standard American threads and nuts and standard bearings. Servicing can be performed in any shop with regular equipment and tools.

A new seven-page bulletin on **sports lighting applications** has been announced as available from the **General Electric Co.** Schenectady 5, N. Y.

Designated GEA-6067, the new bulletin pictures well-planned lighting in football, golf, baseball, basketball and other sports. The numerous benefits of night sports also are outlined.

The publication describes the construction of the G-E L-69 floodlight, the same unit used at major baseball parks. It also offers a manual of complete floodlighting plans designed to assist a community or organization set-up sports lighting facilities.

Electro Tech Equipment Co., 308 Canal Street, New York 13, N. Y., has announced publication of their **Instruments Catalog 54**, which contains illustrations of their complete line of meters, controls, test equipment, and industrial, electrical, and electronic components. The company is an authorized distributor for the meters, instruments and test equipment of nearly a hundred well-known manufacturers. In addition to their New York headquarters, the company maintains a sales office and equipment stocks at a Southern office, located at 690 Murphy Ave., SW, Atlanta, Ga. Copies of the 190-page catalog are available upon request.

Beaver Pipe Tools, Inc., Dana Ave., Warren, Ohio, has recently produced a new, 16-page **Power Machine Catalog**, which is available on request.

Attractively printed in green and white, the catalog covers selling features, dimensions, operating capaci-

for the first time

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*Taken at random from the regular production line

TEST: A standard, 100 ampere, 15 KV HEAVY DUTY TRIP-OUT* (16234-3) was subjected to faults made on the 15 KV side of a 10,000 KVA transformer.

RESULTS: At 14.4 KV with a 20% power factor, the cutout successfully interrupted six shots ranging from 7620 to 8750 amperes, RMS. After the sixth shot, the cartridge and contacts were carefully examined and found to be in perfect working condition.

After the short circuit test, without any adjustment, the cutout was tested for temperature rise. The maximum found was 13°C., as compared to the 30°C. allowed by NEMA on new cutouts.

FIELD TESTS DEMONSTRATE

Ample Heavy Load Interrupting Capacity of KEARNEY Heavy Duty Cutouts

*Taken at random from the regular production line

TEST: Two standard, 100 ampere, 5 KV TRIP-O-MATICS* (indicating 12143-20 and non-indicating 12143-21) were subjected to faults on the 5 KV side of a 10,000 KVA transformer.

RESULTS: At 5 KV with a power factor of 20%, the indicating Trip-O-Matic successfully interrupted nine shots, ranging from 5500 to 6350 amperes, RMS, at 5046 volts. Three additional tests were made on the same box with a new door installed, successfully interrupting 5800, 5750 and 6050 amperes. The non-indicating Trip-O-Matic successfully interrupted four shots ranging from 2800 to 6000 amperes.

After the short circuit test, a heat run was made on the same non-indicating box. Maximum temperature rise was found to be 21° C., as compared to the 30° C. allowed by NEMA on new cutouts.

These test results are proof-positive that Kearney cutouts protect your circuits with *even greater* capacity than their normal ratings.

NOTE:

These reports are NOT BASED ON CALCULATION! They are the results of actual field tests at Kearney's 34.5 KV substation. Power was taken from the Union Electric circuit providing a 445,000 KVA backup.

JAMES R. KEARNEY

FOR BETTER CONSTRUCTION • FOR SAFER MAINTENANCE

244

ties, users, ordering specifications, dies available and accessories for five pipe machines and power drives, plus Beaver's new "55" Universal Nipple Chuck.

Beaver Models "A", "B", "E" Pipe and Bolt Machines and Beaver Models "D" and "C-1" Portable Power Drives are fully described and shown in color. Scores of pen and ink sketches show various adaptations and features of the equipment.

A new, free 32-page catalog has just been published which has complete technical data, descriptions, and information on applications, sizes, stocks, and **use of silicone materials for high temperature Class H electrical insulation.** It has been issued by **Insulation Manufacturers Corp.**, Chicago.

This illustrated catalog covers silicone laminated glass cloth plastics; silicone bonded mica products; silicone rubber and varnish treated glass tubings and sleevings; silicone rubber and resin coated glass cloth and tape; silicone treated glass cord; Silastic pastes and Silastic R tape and cloth; and silicone varnishes, resins, adhesives, compounds, and grease.

Copies of the catalog are available without charge by writing the Publications Dept., Insulation Manufacturers Corp., 565 W. Washington Blvd., Chicago 6, Ill.

A new 24-page, three-color, illustrated booklet entitled **"How To Reduce System Investment By Distribution System Planning and Substation Selection"** has been announced as available from the **General Electric Co.**, Schenectady 5, N. Y.

The booklet (GEA-5847) contains an analysis of distribution investments, a list of factors involved in determining optimum substation size, and a discussion of the types of circuits supplying distribution substations. Also cited in the bulletin are seven trends in low-cost system expansion.

Federal Electric Products Co., 50 Paris St., Newark. N. J., has issued a new booklet on the company's **Stablok Circuit Breakers** entitled "4 Ways to Improve a Modern Masterpiece."

The booklet describes the four newest improvements in Stab-lok circuit breaker design which have been made to further improve Stablok's efficiency under the most extreme operating conditions and in all types of climate.

The 1954 **Fasco fan line** is pictured and described in a new two-color folder from **Fasco Industries, Inc.**, 42 East Ave., Rochester 4, N. Y. Included are table and floor fans, a new 20-inch multi-purpose window fan, and utility exhaust ventilating fans. Also available to the trade is a catalog and specification sheet completely describing Fasco's new 20-inch, reversible window fan.

Continental Bulletin 1052 showing the complete line of Continental Electrical Distribution and Control Equipment, covering every link between utility power source and industrial or institutional application, is available upon request to **Continental Electric Equipment Co.**, Box 1055, Cincinnati 1, Ohio.

Standard Transformer Co., Warren, Ohio, has just released a new descriptive bulletin on OISC **distribution transformers** with built-in surge and overload protective devices. Data and photographs on sizes through 100 kva and ratings through 14,400 volts are included. Write for Bulletin S-302A.

Standard is also offering to the trade copies of Bulletin S-301B, which describes single, high-voltage bushing transformers commonly used on rural lines. Illustrated and described are various types with choice of protective devices. Ratings through 25 kva and voltages 24900GRDY/14400 are covered.

Hevi Duty Electric Co., Milwaukee 1, Wis., manual entitled **"Operation and Maintenance of Dry Type Transformers."** This manual was written to guide management, electricians, and maintenance personnel in the proper installation and care of dry type transformers. The simple trouble chart, included on page nine, helps find trouble spots and gives the necessary remedies. Free copies are available for the asking.

A new **Holophane** handbook, **"Lighting Shopping Centers"** is off the press. The new guide contains 80 pages of information on the illumination of shopping centers, stores and supermarkets. It is available without charge to architects, engineers, contractors, public utility and store executives by writing Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y. Exteriors are treated as carefully as interiors, with special attention paid to parking lots, service yards and common areas.

Electrical Equipment Design for Hazardous Locations is the latest of an annually revised series of 16-page bulletins distributed by **Crouse-Hinds Company** that explain why electrical equipment for hazardous locations is designed and built as it is. This well-illustrated booklet covers explosion pressure dynamics and why explosion-proof lighting fixtures, control boards and receptacles—are necessary for safe operations at Class I (explosive gases or vapors) or Class II (combustible dusts) locations. Request bulletin 2660. Crouse-Hinds Co., Seventh North St., Syracuse, N. Y.

Bulletin 2655, **Crouse-Hinds Company's** 1954 edition of its **Conduleis For Hazardous Locations** series, contains: a table listing the commercial uses of hazardous substances and their flash points and ignition temperatures; Articles 500 and 510 of the 1953 National Electrical Code; and detailed descriptions of explosion-proof and dust-tight electrical equipment conforming to these Code Articles. The 82-page booklet is well-illustrated with photos and line drawings. A valuable reference for qualified personnel. Please state your title or function in requesting Bulletin 2655, Crouse-Hinds Co., Seventh North St., Syracuse, N. Y.

W. W. Grainger, Inc., 2330 W. Adams St., Chicago 12, Ill., has published a 116-page wholesale catalog of leading brands of electrical equipment, copies of which are available upon request. The catalog contains illustrations and descriptions of complete lines of electric motors, electric fans, blowers, pumps, power tools, heating equipment, appliances, etc., which are distributed through dealers exclusively from Grainger's coast-to-coast warehouses. This **"Grainger Motor Book"** is reissued every other month.

Bulletin A, the first of a series of bulletins issued by **Pittsburgh Reflector Co.**, 405 Oliver Bldg., Pittsburgh 22, Pa., covers the **essentials of good lighting**, indicates the recommended illuminating levels of all types of interior installations, explains the difference between fluorescent and incandescent light sources and outlines the procedure for selecting the proper light source, as well as the proper equipment, for each particular job. Copies are available upon request.

A new 28-page, loose-leaf, **completely indexed catalog** has been issued by **Teal Corp.**, 14 Cordier St., Irvington, N. J. The catalog is divided into five series, and the introductory page of each series describes the salient features that are incorporated into Teal equipment, which includes weatherproof holders for spot and flood reflector lamps, weatherproof junction and wiring boxes, vapor-tite lighting fixtures, island and area lights, and weatherproof explosion proof junction boxes and fittings. Copies are available free upon request.

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ESTIMATING—A CONTINUING PROCESS

Electrical estimating is not an exact science because of the many variables that enter into every job between the time an estimate is made and the time the job is completed. But even if there are no formulas that can be used with mathematical certainty, a high degree of accuracy can be obtained by the experienced estimator by giving special attention to every detail, by analyzing the special conditions that enter into every job, by applying correction factors to take care of unusual conditions, and by studying each completed job in comparison with the original estimate in order to benefit from the experience.

Labor data tabulations such as those published in this series are a valuable aid to the electrical estimator. Such data based on ideal working conditions, without interference, and with reasonably efficient labor may not coincide exactly with the conditions that apply on any specific job. Experienced estimators therefore supplement such information with actual data obtained from their own job records.

In order to make the greatest use of your own job data, the job file should be kept as accurately and as completely as possible. In addition to the information usually placed in the job file, such as material invoices, labor time sheets, special tool time, and the various miscellaneous memoranda of charges and expenses, there should be memoranda of the conditions that applied such as the nature of the crews used if all crews operated by the firm are not equally efficient, details of the weather conditions when these were such as to affect operations, the complexity of the job when the nature of the work is such that more than average supervision is required and crews must study details of the plans from time to time. Also, the file should include memoranda of other special conditions that may have influenced the progress of the electrical work such as poor co-operation by other trades and frequent interruptions.

Most of the unusual conditions described above are corrected for by estimators by the addition of a percentage factor applied to the labor hours. When the job files are complete, they provide a valuable source of information, and enable the estimator to check his original judgement as to these special conditions, and thus to improve his judgement and the accuracy of his allowances for special conditions, as time goes on.

Thus the training and development of a good electrical estimator is a continuing process. No published data makes a man an expert estimator, but the careful use of published data, checked and modified by actual job experience will enable an estimator to achieve a high degree of accuracy in his profession.

ARMORED BUSHED CABLE
NEW WOOD WAREHOUSES

NO CONDR'S. SIZE	HRS.-"C"	LABOR COST INSTALLED AT FOLLOWING RATES PER FT.										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
2/14	3.6	.045	.054	.063	.072	.081	.09	.099	.108	.117	.126	.135
3/14	3.8	.048	.057	.067	.076	.086	.095	.105	.114	.124	.133	.143
4/14	4.0	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15
2/12	3.6	.045	.054	.063	.072	.081	.09	.099	.108	.117	.126	.135
3/12	3.8	.048	.057	.067	.076	.086	.095	.105	.114	.124	.133	.143
4/12	4.0	.06	.072	.084	.096	.108	.12	.132	.144	.156	.168	.18
2/10	3.8	.048	.057	.067	.076	.086	.095	.105	.114	.124	.133	.143
3/10	4.2	.053	.063	.074	.084	.095	.105	.116	.126	.137	.147	.158
4/10	4.8	.06	.072	.084	.096	.108	.12	.132	.144	.156	.168	.18
2/8	4.2	.053	.063	.074	.084	.095	.105	.116	.126	.137	.147	.158
3/8	4.8	.06	.072	.084	.096	.108	.12	.132	.144	.156	.168	.18
4/8	5.5	.069	.083	.096	.11	.124	.138	.151	.165	.179	.193	.206
2/6	5.0	.063	.075	.088	.10	.113	.125	.138	.15	.163	.175	.188
3/6	5.7	.071	.086	.10	.114	.128	.143	.157	.171	.185	.20	.214
4/6	6.4	.08	.096	.112	.128	.144	.16	.176	.192	.208	.224	.24
2/4	6.1	.076	.092	.107	.122	.137	.153	.168	.183	.198	.214	.229
3/4	6.8	.085	.102	.119	.136	.153	.17	.187	.204	.221	.238	.255
4/4	7.7	.096	.116	.135	.154	.173	.193	.212	.231	.25	.27	.289

LABOR: INCLUDES DRILLING, CUTTING, INSTALLATION, STRAPPING AND CONNECTED TO BOXES (NO TAPS)

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THE ORIGINAL INDENTER TYPE E.M.T. COUPLINGS AND CONNECTORS

Briegel, the Original Indenter Fittings are neater in appearance, easier and faster to use. Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job.

All B-M Indenter Fittings are U. L. approved as Concrete-tight and for General Use. (File Card E 10863)

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COND. SIZE	HOURS PER "C"	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1/2"	6.2	.0775	.093	.1085	.124	.1395	.155	.1705	.186	.2015	.217	.2325
3/4"	6.7	.0838	.1005	.1173	.134	.1508	.1675	.1843	.201	.2178	.2345	.2513
1"	7.9	.0988	.1185	.1383	.158	.1778	.1975	.2173	.237	.2568	.2765	.2963
1 1/4"	10.6	.1325	.159	.1855	.212	.2385	.265	.2915	.318	.3445	.371	.3975
1 1/2"	12.4	.155	.186	.217	.248	.279	.31	.341	.372	.403	.434	.465
2"	17.1	.2138	.2565	.2992	.342	.3848	.4275	.47	.513	.556	.599	.6413
		RIGID										
1/2"	6.5	.0813	.0975	.1138	.13	.1463	.1625	.1788	.195	.2113	.2275	.2438
3/4"	7.1	.0888	.1065	.1243	.142	.1598	.1775	.1953	.213	.2308	.2485	.2663
1"	8.3	.1038	.1245	.1453	.166	.1868	.2075	.2283	.249	.2698	.2905	.3113
1 1/4"	11.2	.14	.168	.196	.224	.252	.28	.308	.336	.364	.392	.42
1 1/2"	14.1	.1763	.2115	.2468	.282	.3173	.3525	.3878	.423	.4583	.4935	.5288
2"	17.9	.2238	.2685	.3133	.358	.4028	.4475	.4923	.537	.5818	.6265	.6713
2 1/2"	22.8	.285	.342	.399	.456	.513	.57	.627	.684	.741	.798	.855
3"	30.0	.375	.45	.525	.60	.675	.75	.825	.90	.975	1.05	1.125
4"	46.5	.5813	.6975	.8138	.93	1.046	1.163	1.279	1.395	1.511	1.628	1.744
5"	76.7	.9588	1.151	1.342	1.534	1.726	1.918	2.109	2.30	2.493	2.685	2.876
6"	108.2	1.353	1.623	1.894	2.164	2.435	2.705	2.976	3.246	3.52	3.79	4.06

NOTE FOR HANGER INSTALLATION: NOR ONE PIPE OR A SERIES OF PARALLEL RUNS ON A HANGER, REDUCE ABOVE FIGURES BY 33% AND ADD FOR INSTALLATION OF HANGERS AS REQUIRED.

LABOR: INCLUDES DRILLING, INSTALLATION OF CONDUIT, CONNECTING TO BOXES AND ANCHORS. (NO WIRE OR TAPS).

SERVICE HEADS
THINWALL

COND. SIZE	HRS. EA.	LABOR COST INSTALLED EACH AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1/2"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
3/4"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
1"	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
1 1/4"	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
1 1/2"	.4	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50
2"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
		RIGID										
1/2"	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
3/4"	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
1"	.4	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50
1 1/4"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
1 1/2"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
2"	.6	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
2 1/2"	.7	.88	1.05	1.23	1.40	1.58	1.75	1.93	2.10	2.28	2.45	2.63
3"	.8	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
4"	.9	1.13	1.35	1.58	1.80	2.03	2.25	2.48	2.70	2.93	3.15	3.38
5"	1.1	1.38	1.65	1.93	2.20	2.48	2.75	3.03	3.30	3.58	3.85	4.13
6"	1.3	1.63	1.95	2.28	2.60	2.93	3.25	3.58	3.90	4.23	4.55	4.88

LABOR: INCLUDES MOUNTING BASE (ON GROUND) AND INSTALLING CAP AFTER CONDUCTORS ARE INSTALLED IN CONDUIT.

Electrical Estimating—III

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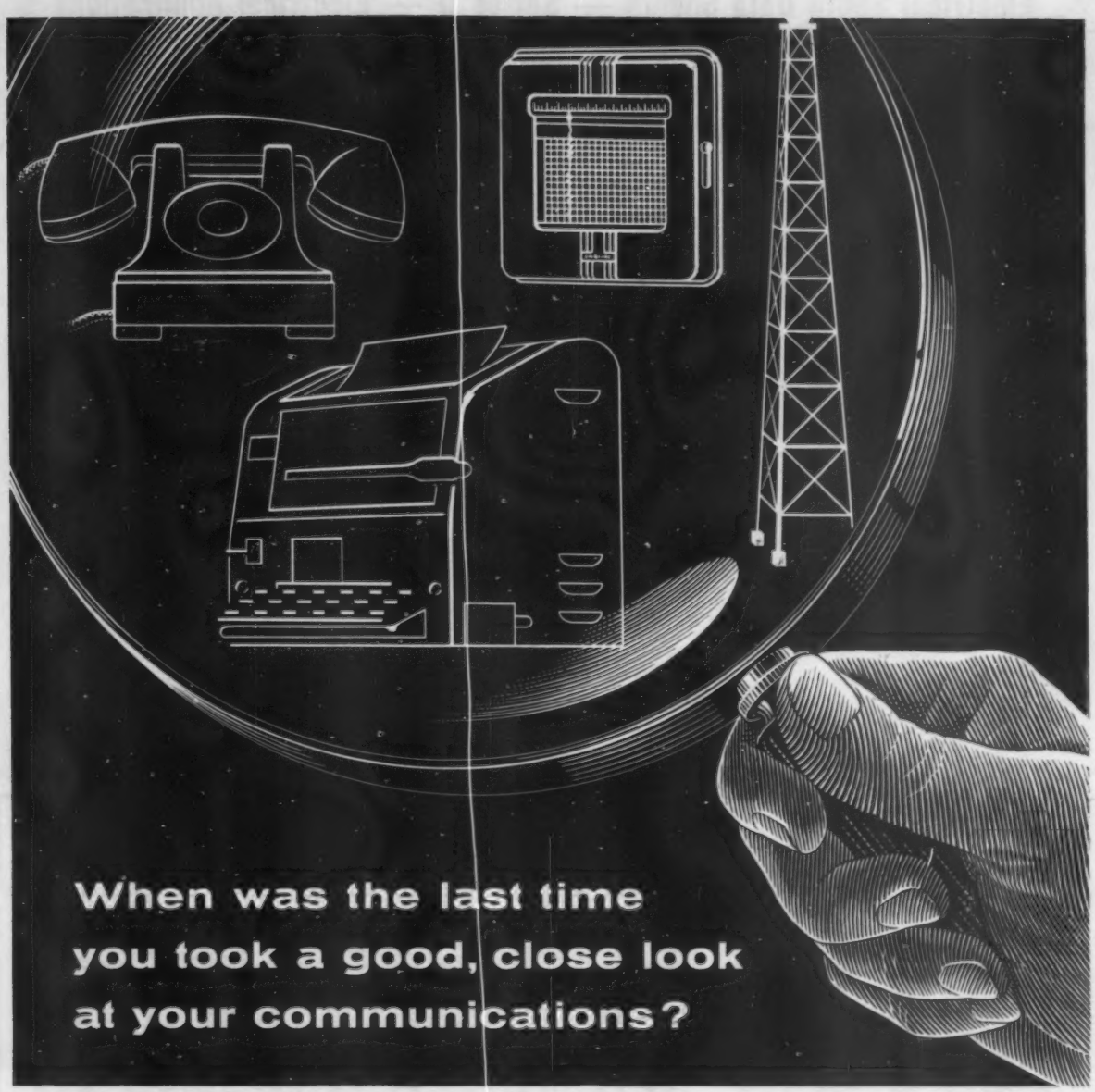

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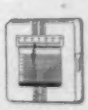

METERING CHANNELS

BELL TELEPHONE SYSTEM

Lighting Equipment Applications—Page 3

Fundamental Equations

Luminous Intensity (Candlepower): The principal equations relating to luminous intensity are those relating candlepower to footcandles and distance, and relating mean spherical candlepower to lumens or luminous flux.

$I = E \times d^2$ where I represents candlepower, E represents illumination intensity in footcandles, and d is distance in feet. The inverted form of this equation, $E = I/d^2$, is the one which permits the determination of the illumination on a surface from the information given in the candlepower distribution curves for lamps and reflectors.

$I_{ms} = F/12.57$ where I_{ms} represents mean spherical candlepower, F represents luminous flux in lumens, and 12.57 is a constant (surface area in square feet of a sphere having a radius of one foot).

Luminous Flux (Lumens): In addition to the equation given above, relating lumens to the mean spherical candlepower of a light source, there are two important formulas relating lumens to illumination (footcandles) and brightness (footlamberts).

$F = E \times A$ where F represents lumens, E represents footcandles, and A is area in square feet. In this case F is the lumens incident on a surface, resulting in the illumination of the surface.

$F = B \times A$ where F represents lumens, B represents footlamberts, and A is area in square feet. In this formula F is the lumens emitted or reflected by a surface.

$F = 12.57 \times I_{ms}$ where F represents lumens, I_{ms} is the mean spherical candlepower of a light source, and 12.57 is a constant (surface area in square feet of a sphere having a radius of one foot).

Illumination (Footcandles): The most important equation relating to illumination is that generally known as the "inverse square law." In accordance with this law, the illumination of a surface decreases inversely as the square of the distance of the surface from the light source. When the light rays are perpendicular to the surface illuminated, the equation takes the following form:

$E = I/d^2$ where I represents candlepower of source in the direction perpendicular to the illuminated surface, E represents the illumination of the surface in footcandles, and d is the distance of the surface in feet from the light source.

Lighting Equipment Applications—Page 4

When the light rays are not perpendicular to the surface being illuminated, the above equation must be modified. In such cases, let the angle which the light rays make with the vertical be given as theta, ∅; then the inverse square law for the illumination of a horizontal surface becomes:

$$E_h = \frac{I \times \text{cosine } \varnothing}{d^2}$$ where E_h represents the illumination on the horizontal surface in footcandles, I represents the candlepower of the light source in the direction indicated by the angle theta, ∅, and d is the distance of the surface in feet from the light source.

The corresponding equation for the illumination of a vertical surface is:

$$E_v = \frac{I \times \text{sine } \varnothing}{d^2}$$ where E_v represents the illumination on the vertical surface in footcandles, I represents the candlepower of the light source in direction indicated by the angle theta, ∅, and d is the distance of the surface in feet from the light source.

Another important equation involving footcandles is that which relates footcandles of illumination to lumens and area:

$E = F/A$ where E represents the footcandles incident on a surface, F represents the luminous flux in lumens falling on the surface, and A is the area of the surface in square feet.

Brightness (Footlamberts): One of the most important of the footlambert equations is that which involves the "reflection factor" of the surface:

$B = E \times r$ where B represents brightness in footlamberts, E represents illumination in footcandles, and r is reflection factor expressed as a decimal (the ratio of the light reflected by the surface to the light incident on the surface).

Other important relationships involving footlamberts are:

$$B = \frac{F \times r}{A}$$ where B represents brightness in footlamberts, F represents the lumens incident on the surface, r is the reflection factor of the surface, and A is the area of the surface in square feet.

One candlepower per square inch equals 452 footlamberts.

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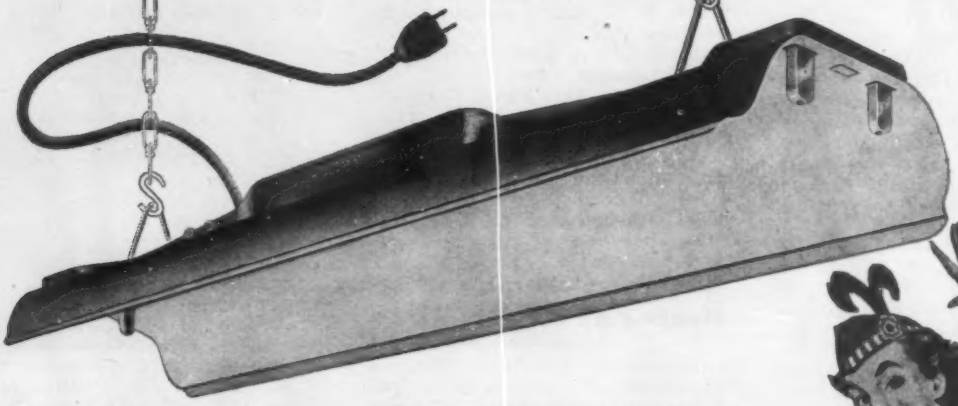

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LIGHTING • RADIO • ELECTRONICS • TELEVISION

News of the industry

edited for Southern readers

Southeastern Electric holds annual conference

THE TWENTY-FIRST Annual Conference of the Southeastern Electric Exchange was held at the Boca Raton Hotel and Club, Boca Raton, Fla., March 22-24, with President L. C. McClurkin, president, Savannah Electric & Power Co., Savannah, Ga., presiding over the opening session. Mr. McClurkin's "President's Address" was one of the highlights of the first day's session of the conference.

Other addresses of the opening session were the opening remarks by McGregor Smith, president, Florida Power and Light Co., Miami, Fla.; "Our Business is to Serve" by Walter H. Sammis, president, Edison Electric Institute, and president, Ohio Edison Co., Akron, Ohio; "The Centennial Jubilee" by Gwilyn A. Price, president, Westinghouse Electric Corp., Pittsburgh, Pa.; and "The Federal Power Policy" by Ralph A. Tudor, under secretary, Department of Interior, Washington, D. C.

Harllee Branch, Jr., SEE vice-president and president, Georgia Power Co., Atlanta, Ga., presided over the proceedings of the second day of the conference.

The morning session of this portion of the conference included addresses "What's Ahead for Business" by Dexter M. Keezer, vice-president and director, Dept. of Economics, McGraw-Hill Publishing Co., New York, N. Y.; and "The Future of the Free Enterprise System," by Governor Theodore R. McKeldin, of Maryland.

"The Outlook for Electric Utility Common Stocks" and "Light's Diamond Jubilee" were topics for addresses delivered respectively by Frederick W. Page, vice-president, Tri-Continental Corp., New York, N. Y., and Ralph P. Wagner, chairman Program Committee, Light's Diamond Jubilee, Niagara Mohawk Power Co., Albany, N. Y., at the afternoon session of the second day of the group's annual conference.

"Public Utility Rates—Selling the Residential Demand Charge" by Edwin Vennard, president, Middle West Service Co., Chicago, Ill.; and "Changing Electric Utility Sales Responsibilities in a Changing America" by George E. Whitwell, vice-president, Philadelphia Electric Co., Philadelphia, Pa., were addresses presented at the morning session of the concluding day of the conference.

The concluding session featured addresses "Through the Looking Glass," by Joseph Pope, vice-president, Stone & Webster Engineering Corp., New York, N. Y.; "Atomic Energy and Electric Power" by E. H. Dixon, president, Middle South Utilities, Inc., New York, N. Y.; and a report of committees.

W. J. Clapp, Southeastern Electric Exchange vice-president, and president, Florida Power Corp., St. Petersburg, Fla., presided over the last day's sessions.

Social activities of the three-day annual conference included the annual dinner, a steak roast, and the directors' breakfast meeting.

Virginian Electric opens Huntington branch office

VIRGINIAN ELECTRIC, INC., a Charleston, W. Va., wholesale firm, has opened a new branch office and warehouse at 715 Thirteenth St., Huntington, W. Va.

The firm will conduct wholesale operations of its lines of appliances and electrical equipment from the new 60 by 240-foot building. C. E. Thoma is manager of the Huntington branch, which is staffed by 15 other employees.

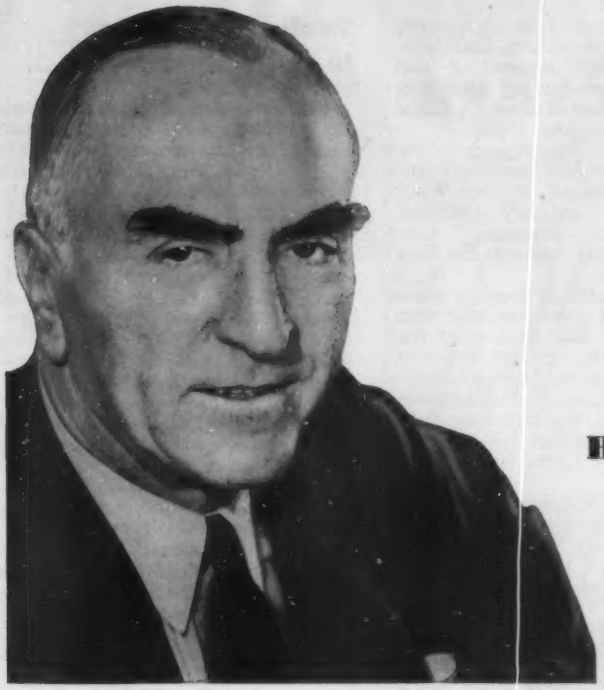
Oklahoma Utilities hold annual convention

THE THIRTY-SIXTH Annual Convention of the Oklahoma Utilities Association was held recently at the Oklahoma Biltmore Hotel in Oklahoma City. President Earl J. Newlin presided over the meeting, assisted by Harry W. Pitzer and H. C. Webb, association vice-presidents.

Highlights of the two-day meeting included addresses by leading figures in the utility field, including "Socialization Through Taxation," by D. W. Reeves, executive vice-president, Public Service Company of New Mexico, Albuquerque, N. M.; "How Public Utilities Look to the Investor," by Marvin Chandler, vice-president, Reis & Chandler, Inc., New York, N. Y.

"Your Responsibility in Getting Things Done," by Kinsey M. Robinson, president, the Washington Water Power Co., Spokane, Wash.;

ELECTRICAL CARNIVAL—The E. & H. Electric Supply Co., Louisville, Ky., staged a Carnival of Electrical Apparatus recently. The Carnival was visited by several thousand electrical contractors, builders, engineers, industrial purchasing agents and plant maintenance men. Forty suppliers presented informative displays, manned by technical and sales representatives. E. J. Theobald, Jr., is president, Harold L. Theobald, secretary and treasurer, and James B. Stengel, sales manager of E. & H. Electric Supply.



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"Why Proper Training of Management Personnel," by C. I. Wall, vice-president, Pioneer Natural Gas Co., Lubbock, Texas; "The Natural Gas Business and the Electric Business," by Paul Kayser, president, El Paso Natural Gas Co., Houston, Texas; and "People Are Problems," by Robb M. Winsborough, vice-president, Middle West Service Co., Chicago, Ill.

Kentucky REA, utility plan joint program

KENTUCKY'S rural electric co-operatives and Kentucky Utilities Co., have made plans to join forces in working "toward the further social and economic improvement of the rural areas of the state."

Roy York, Lawrenceburg, manager of the Fox Creek Co-operative, was chosen as chairman of the executive committee of the new organization at a recent meeting in Lexington. E. R. Murphy, Kentucky Utilities farm service director, is secretary of the committee.

Judge Robert D. Coleman, chairman of the Kentucky Public Service Commission, looks on as Robert M. Watt, left, and Alex B. Veech, sign the agreement.

Other members of the executive committee are J. K. Smith, Louisville, executive manager of the Kentucky Rural Electric Co-operative and F. I. Fairman, Kentucky Utilities vice-president, both ex-officio members; Allen P. Adair, Cynthiana, vice-president of the Kentucky R.E.C. and director of the Harrison County electric co-operative; J. R. Miller, Owensboro, manager of the Green River electric co-operative; L. R. Hughes, Elizabethtown, and Paul A. Whitmer, Earlington, assistant division managers of Kentucky Utilities.

First step in the planned program was accomplished recently with the signing of an agreement for the interconnection and integration of their generating and transmission systems by Kentucky Utilities and East Kentucky Rural Electric Co-operative Corp.

The contract was signed in the offices of the Public Service Commission, Frankfort. R. M. Watt, president of Kentucky Utilities, signed for his company, Alex Veech, president, signed for East Kentucky.

Hugh L. Spurlock, general manager of the co-operative said that East Kentucky will soon start the operation of two 20,000 kilowatt generating units now being installed in the William C. Dale Power Station at Ford, Ky. The first unit, he said, is scheduled for completion about May 1, the second unit June 1, 1954.

According to the agreement K.U. will continue to serve load centers of East Kentucky's member co-operatives until the units in the Dale Station are in commercial operation. After the units are installed, K.U. will furnish East Kentucky's power requirements in excess of 40,000 kilowatts in the area covered by the agreement until other units are installed by East Kentucky.

East Kentucky proposes to acquire approximately 135 miles of transmission lines from its member co-operatives and complete construction of approximately 840 additional miles of line during 1954 and 1955. K.U. proposes to add 207 miles of transmission lines to its existing 3500 miles to interconnect with East Kentucky. These lines also are scheduled for completion during 1954 and 1955.

The agreement, initially for a period of ten years, may be continued thereafter unless terminated by a three-year notice from either party.

Small shop problems to get NISA emphasis

THE ADMINISTRATIVE and technical problems confronting the small industrial electrical equipment repair shop will be given emphasis during the 1954 convention of the National Industrial Service Association, to be held in Detroit, June 13-17 at the Hotel Statler.

Convention Committee Chairman Charles J. Cannon, Nimmo Electric Co., Detroit, Mich., announced: "Every effort is being made to arrange a complete program to interest the smaller shops."

"We want to point out, too," Mr. Cannon added, "that those wives of small shop operators who help their husbands in their businesses are invited—in fact, urged—to attend the business and technical sessions of the convention."

The 1954 convention of NISA will be the 21st annual gathering of members of the industrial electrical equipment repair organization whose membership includes shops in every state in the United States and several Canadian provinces as well as Mexico, Puerto Rico, Cuba, Trinidad and Hawaii.

The June dates were selected to encourage members to bring their wives and children and to take advantage of special family rates at the hotel. Heretofore NISA conventions have been held in April or May of each year.

Kearney Fayetteville plant begins operations

JAMES R. KEARNEY CORP., St. Louis, Mo., has begun the manufacture of fuse links for distribution cutouts at its new Fayette-

Members of the executive committee planning a joint program by Kentucky's rural electric co-operatives and Kentucky Utilities Company are, from left, J. R. Miller, E. R. Murphy, F. I. Fairman, Roy York, J. K. Smith, L. R. Hughes.

ville, Ark., factory. This is the first unit completed in the Kearney program for multiplant operation.

Facilities are included in the new plant for warehousing other equipment to serve customers in the South Central and Southwest United States.

Vernon Hellstern, a graduate of Washington University, has been appointed manager of the Fayetteville plant. He has been a member of the Kearney Engineering Department for 13 years.

Kearney also recently announced the opening of five new warehouses, including one at Lexington, Ky.

Electrical Institute held by N. C. group

THE ANNUAL TWO-DAY Electrical Institute sponsored by the Board of Examiners of Electrical Contractors of the State of North Carolina, was held at the Carolina Hotel, Raleigh, recently. The meeting was under the supervision of N. E. Cannady, Oxford, N. C., state electrical engineer and inspector.

There were no speeches or papers presented, the entire meeting being devoted to panel discussions which took up Code questions, interpretations, changes, inspector-contractor problems, etc.

Other subjects discussed include bonding and grounding of services, color coding, recessed fixtures, three-phase four-wire panels and distributions, window air conditioning, emergency systems and lighting, transformer vaults, hospital operating rooms, low voltage lightning arrestors, electrical heating for houses, school illumination, and various types of wires and cables and their uses.

Sangamo to manufacture correction capacitors

PLANS TO MANUFACTURE power factor correction capacitors have been announced by the Sangamo Electric Co., Springfield, Ill. Although known in the electric utility field primarily as manufacturers of watthour meters, Sangamo has been in the electronics capacitor business continuously for the past thirty years. They are now a major supplier of mica, electrolytic, and paper capacitors to the electronic industry and military forces, and own and operate a capacitor plant in Marion, Ill.

Sangamo will handle sales through their utility sales organization at Springfield, while manufacture of the new capacitors will be at the Marion plant. Actual production is not expected for about a year.

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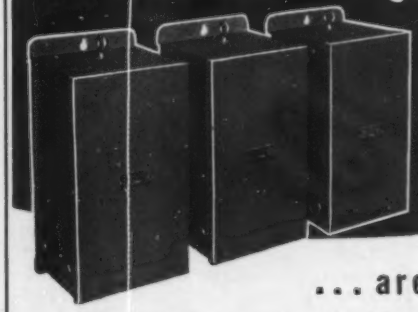

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Raybro Electric holds general sales meeting

RAYBRO ELECTRIC Supplies, Inc., recently held a very successful general sales meeting at its Twin Lakes property on the outskirts of Tampa. According to Troy A. Brown, president, and M. O. Hollis, secretary-treasurer and general manager, the two-day session was one of the best held in recent years and the company's some fifty-odd salesmen returned to their respective territories convinced they can make 1954 a banner year in all departments of its electrical wholesaling.

Raybro's five offices, located in Tampa, Jacksonville, Miami, St. Petersburg, and Orlando, were represented by its branch managers, merchandise and territory salesmen.

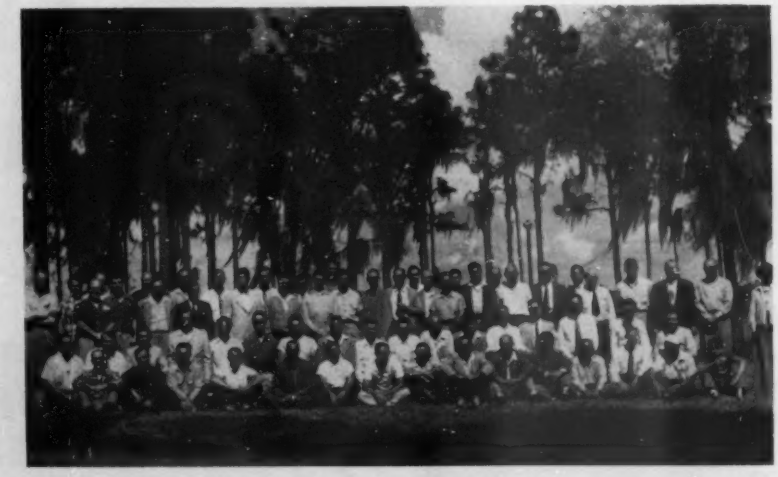
Eleven manufacturers were represented by top sales personnel having definite spots on the program for presenting their products. In attendance and appearing on the program were: D. B. Clark, district manager, Lamp Dept., General Electric Co., assisted by Don Mohler, from Nela Park, D. F. Faulkner, Jacksonville representative, and Wally Holtsinger, Miami representative; Don Nickell, district manager, Square D Co.; Joe Crevasse, district manager, Day-Brite Lighting, Inc.; W. J. Pfeif, district manager, Small Appliance Division, General Electric Co., assisted by J. J. Loeffler, Atlanta, and J. D. McPherson, Jacksonville, district representatives; Robert L. White, district manager, National Presto Industries, Inc.; Coy W. Brown, district manager, General Electric water coolers; Frank Moos, district representative, John C. Virden Co.; Charlie Lee, Allen-Bradley district representative; Charlie Ottinger, district manager, W. W. Welch Co.; James F. Lehan, district manager, Sunbeam Corp., assisted by Mrs. Thelma Holly; Herman H. Crout, district manager, Hunter Fan & Ventilating Co.; John Carter, district manager, Kearney Corp., assisted by Frank Moody and Alvin W. Kohler; and J. D. Griffin, district manager, South East-Joslyn Co., assisted by Ronald Broome.

The meeting was in charge of J. A. Mook, Jr., manager of merchandising, advertising and sales promotion. He was assisted by R. E. Joines, who presented several new sales promotions, including some with attractive incentives for the salesmen.

'Tremendous growth' of Arkansas Power cited

THE TREMENDOUS growth of Arkansas Power & Light Co., Little Rock, Ark., was cited in a recent statement by Lyle B. Hayden, speaking for the Little Rock division engineers at the company's annual managers' meeting. In tracing the history of AP&L's engineering departments, he noted that a division engineer's classification has been established only since 1946.

"I realize," Mr. Hayden said, "you have heard before of the tremendous growth this company has experienced, but let me remind you of a few facts. Since January 1, 1945, we have built 12,387 miles of rural lines and connected 101,508 rural customers; added 60,459 urban residential customers, 15,938



Branch managers, merchandise and territory salesmen from the Tampa, Jacksonville, Miami, St. Petersburg, and Orlando offices of Raybro Electric Supplies, Inc., are shown with attending manufacturer's representatives at the firm's recent general sales meeting in Tampa.

urban commercial customers, and 582 other customers.

"The past year, 1953, has proven to be one of continued growth. A total of 15,634 customers were connected, requiring the preparation of 7,085 AFA's. In addition to this revenue work, we have all had to spend a great deal of time on distribution improvement."

Mr. Hayden noted that engineering department plans will, generally, follow those of last year, with a few anticipated additions.

He said that the division engineer's goals would be: continued standardization of methods and procedures throughout the seven divisions; sustained search for means of reducing costs and eliminating waste; discussion of problems and experiences common to all divisions; and suggested revisions and corrections of the Construction Specifications Handbook.

NAWB issues sheet of contractor ads

A NEW CATALOG PAGE presenting a pair of advertisements designed for use by electrical contractors has been announced by the National Adequate Wiring Bureau, 155 East 44th St., New York 17, N. Y.

The ads are offered in the form of modestly-priced electros. They are designed for use in the classi-

ARE YOU WIRED FOR THE ELECTRICAL FUTURE?
To make your light-line your life-line to full electrical living
CHECK THESE POINTS NOW!
DO YOU HAVE—
• A large enough service panel?
• Enough outlets?
• Large enough wire?
• Enough circuits?
For all the illumination you need?
All-at-once use of all appliances?
When you call us for help, advice, estimate...
ASK FOR ADEQUATE WIRING!

This is one of the two telephone book type advertisements available in electro form for contractor use.

fied section of local telephone books; patterned after the style most contractors seem to favor when drawing up their own ads; and angled to arouse curiosity about adequate wiring.

Each electro is made so that the contractor's firm name can be easily added. The ads are planned to allow the contractor to represent himself as the man who knows adequate wiring standards, and has more to offer the customer.

Copies of the ad proof sheet are available upon request.

ARRO
Take a Closer Look
at any of the products carrying the Arro Trademark and you will find that the quality of the material and workmanship is "tops" . . . so solve your drilling and anchoring problems by specifying Arro.
TRADE ARRO MARK
ARROFLUTE CARBIDE MASONRY DRILL
LAG SCREW EXPANSION SHIELD
A-C-E EXPANSION SHIELD
DOUBLE EXPANSION SHIELD
O-E EXPANSION SHIELD
MACHINE SCREW ANCHOR
STUD BOLT ANCHOR
LEAD SCREW ANCHOR
MAL-LEAD BOLT ANCHOR
TWO WING SPRING-TYPE TOGGLE BOLT
SPRING HEAD STEEL TOGGLE BOLT
RIVETED HEAD TOGGLE BOLT
LITTLE MAJOR TURNBUCKLE
FOUR-POINT HAND STAR DRILL
THREE-POINT DRILL POINT
FOUR-POINT DRILL POINT
TWIST DRILL POINT
RUBBERGRIP DRILL POINT HOLDER
See your industrial, hardware or electrical supplier
ARRO EXPANSION BOLT COMPANY
1520 Boone Ave., Marion, Ohio

NEW TOMIC QUARTERS—Charles G. Lifka, president of Tomic Sales and Engineering Co., Detroit, Mich., has announced that the company recently moved into its own, new building (above) at 20000 Sherwood Avenue. The new quarters provide larger and more modern facilities to handle the company's operations and plans included adequate space for expansion of the firm's lines.

Nepo Company granted three new patents

NEPO MANUFACTURING CO., 527 South Wells St., Chicago 7, Ill., has announced that it has been granted U. S. Patents No. 2,653,002 and 2,660,391 on models (catalog number) W52A and R52B hinged brackets and mast arms, which the company produces.

N. E. Passman, head of Nepo, also announced that the company has obtained U. S. Patent No. 2,271,836 covering the spinning of the Alzac processed aluminum reflector directly over the glass refractor of the Nepo catalog number 100D Mercury Vapor Luminaire.

The company will announce shortly a complete line of floodlighting equipment, developed around their patents. It is also announced that a complete new catalog describing the Nepo line of lighting equipment, poles and fittings will be available in the near future. Persons desiring a copy of this new catalog may send their request directly to the company.

Tomic Sales names four Southern representatives

TOMIC SALES & ENGINEERING CO., Detroit, Mich., has announced the appointment of four new Southern sales agents.

J. T. Pearson, 1403 N. W. Second St., Miami, Fla., has been named to cover the Southern half of Florida; Robert C. Bronsvel, 2705 Rainbow Rd., Jacksonville, Fla., has the northern half of Florida as his territory; J. B. Richardson, 439 Deerwood Dr., Columbia, S. C., has North and South Carolina; and J. Matthews, 205 3rd Ave., N., Nashville, Tenn., has the State of Tennessee.

Magni Flood announces lighting sales contest

MAGNI FLOOD, INC., 38 N. Second Ave., Mt. Vernon, N. Y., has announced its Light's Diamond Jubilee prize campaign, which has already begun and will continue through July 31, 1954.

Those eligible for the contest are all countermen, distributor salesmen, outdoor lighting equipment purchasing agents, quotation clerks, price and credit men.

This brochure includes complete information on Magni Flood's sales prize campaign for 1954.

The objective of the campaign is to stimulate the sale of Magni Flood outdoor sealed beam floodlighting equipment in a six months selling drive during Light's Diamond Jubilee.

Points will be awarded for sales made and will be redeemable for prizes such as golf clubs, watches, silver, dishes, electric shavers, radios, etc. For entering the contest, each participant will receive 200 points gratis. Other details of the contest are available from the company.

POWER CIRCUIT TRANSFORMERS

The most economical way of providing low voltage circuits for the lighting and operating of machine tools is to run a branch line from the power line, using a transformer to step down the voltage. For use on circuits of 600 volts or less. Sizes: 50 V.A. to 37½ K.V.A. Primary and secondary are in separate compartments, eliminating the necessity of additional wiring boxes.

Send for NEW CATALOG

DONGAN ELECTRIC MFG. COMPANY

2998 Franklin — Detroit 7, Mich.

Southern Representative:
George R. Koeln
144 Walker St., S.W.
Atlanta 3, Ga.

DONGAN TRANSFORMERS

The Dongan Line Since Nineteen-Nine

Dates Ahead

South Carolina Chapter, IAEI, annual meeting, April 15-16, 1954. Hotel Columbia, Columbia, S. C.

Georgia Chapter, IAEI, annual meeting, April 19-20, 1954, Griffin Hotel, Griffin, Ga.

Alabama Chapter, IAEI, annual meeting, April 22-23, 1954. Thomas Jefferson Hotel, Birmingham, Ala.

7th Annual Conference for Protective Relay Engineers, A & M College of Texas, College Station, Texas, April 26-28, 1954. Conference chairman, L. M. Haupt, c/o A & M College.

Southeastern Electric Exchange, Engineering and Operation Section, Sans Souci Hotel, Miami, Fla., May 6-7, 1954.

George Welman, North Louisiana-East Texas, Texas and Texas Gulf Coast Chapters, IAEI, annual meeting, May 7-8, 1954. Edson Hotel, Beaumont, Texas.

Virginia Chapter, IAEI, Annual Meeting, Maple Shade Inn, Pulaski, Va., May 10-11, 1954.

Nashville Electric Show, third annual, Electric Center Drive-Thru Garage, Church Street at 13th Avenue, Nashville, Tenn., May 11-14, 1954.

Edison Electric Institute, Annual Convention, Atlantic City, N. J., June 1-4, 1954.

National Association of Electrical Distributors, Annual Convention, Atlantic City, N. J., Week of June 6, 1954.

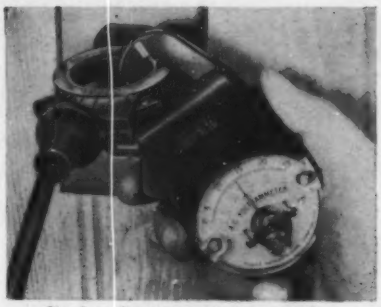
National Industrial Service Association, Annual Convention, Hotel Statler, Detroit, Mich., June 13-17, 1954.

Illuminating Engineering Society, Midwestern Regional Conference, Jefferson Hotel, St. Louis, Mo., June 17-19, 1954.

Public Utilities Association of the Virginias, Thirty-Sixth Annual Meeting, Sept. 16-18, 1954. The Greenbrier, White Sulphur Springs, W. Va.

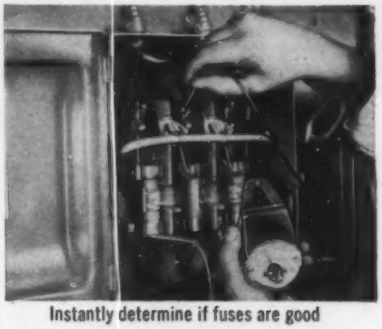
Florida Chapter, IAEI, Joint Meeting with Southern Section, Tampa Terrace Hotel, Tampa, Fla., Oct. 25-27, 1954.

Southern Section, IAEI, Tampa Terrace Hotel, Tampa, Fla., Oct. 25-27, 1954. Conference chairman, R. A. Miller, Tampa.



Check appliance current at receptacle

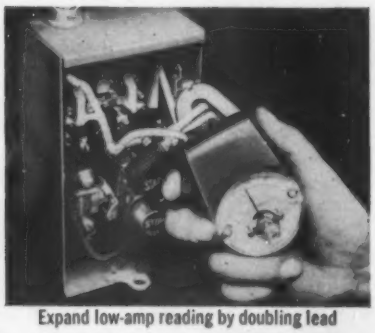
Trouble-shoot relays quickly



Instantly determine if fuses are good

Know if the load is balanced

Know if windings are grounded



Expand low-amp reading by doubling lead

Eliminate Guesswork!

NOW *EVERY* MAN CAN BE EQUIPPED WITH THIS POCKET VOLT-AMP TESTER

Here is a real improvement for the men on your crew who now use a voltage tester. It's the Amprobe Jr., a pocket tester that measures both voltage and current, with instrument accuracy, without shutting down equipment. And the cost is only $19.85 (just a few dollars more than an ordinary voltage tester), so every electrician and plant maintenance man can carry one.

Pick the Amprobe Jr. that fits the job. 7 models from 0-10 amp to 0-100 amp; choice of either 0-125/250 volts A-C or 0-150/600 volts A-C range. For higher current applications, multi-range Amprobes available for 300, 600 or 1200 amperes. See the full line of Amprobe snap-around volt-ammeters at your jobber's today. PYRAMID INSTRUMENT CORP., LYNBROOK, N.Y. *(Export Div.: 458 Broadway, N. Y. 14)*

Amprobe Jr.®
snap-around volt-amp tester **$19.85**

Send for these free Amprobe service bulletins:

Pyramid Instrument Corp.
Dept. ES 44, Lynbrook, N. Y.

Please send me the Amprobe service bulletins checked below:

- ☐ How to cut costs and land more jobs
- ☐ Trouble-shooting electric motors
- ☐ How to boost service profits
- ☐ Portable test instruments

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

News about people

Montague H. Hicks has been appointed district representative for **Reliable Electric Co.**, Chicago, with a three-state territory consisting of North Carolina, Virginia and Ohio. His headquarters will be at 2713 Lockmore Drive, Raleigh N. C. Reliable Electric manufactures power-line connectors, construction specialties, and telephone protective equipment. Mr. Hicks was associated with the Carolina Power and Light Company for many years, serving as commercial manager for the past 14 years. He is a graduate of Clemson College.

Roger H. Bolin has been appointed manager of general advertising for **Westinghouse Electric Corp.**, it was announced recently by **J. H. Jewell**, vice-president. Mr. Bolin succeeds **Harry J. Deines**, who has left Westinghouse to accept a position as vice-president of the J. Walter Thompson advertising agency in New York.

A native of Brazil, Ind., Mr. Bolin began his career with Westinghouse in 1925 upon graduation from Rose Polytechnic Institute. Within a few years after joining the company's advertising department as a graduate student trainee, he was supervising Westinghouse refrigeration and air conditioning advertising. In 1937, he was named advertising manager of the Westinghouse Appliance Division, Mansfield, Ohio.

In 1949, Mr. Bolin was appointed assistant to **J. M. McKibbin**, vice-president and general manager in charge of the Westinghouse consumer products divisions—from which duties he comes to his present assignment.

Elliott Co., Jeannette, Pa., has announced the opening of a new sales office in New Orleans at 256 Lee Circle Building, to service Southern Mississippi and Louisiana. Its staff includes **G. C. Bayles** as manager, and **C. W. Britt, Jr.**, both formerly in the company's Atlanta office. Mr. Bayles attended Polytechnic Institute of Brooklyn, and was a marine engineer at the United States Navy Yard in Philadelphia before joining Elliott's research and development department in 1945. In 1949 he was transferred to application engineering, and in 1953 to their Atlanta district office as a field engineer.

Elliott recently named **F. L. Humphrey, Jr.**, assistant district manager in their Atlanta territory. Mr. Humphrey joined the company in 1938 following his graduation from Georgia Institute of Technology as an electrical engineer. After completion of the Elliott training program, he was assigned to their Atlanta office as a field engineer. In 1942 he entered the army and served for four years, returning in 1946 to the Atlanta office.

Wilbur S. Holton, assistant general sales manager of **Orangeburg Manufacturing Co., Inc.**, New York, N. Y., has been elected vice-president, according to an announcement by that company, a leading producer of underground electrical fibre conduit and bituminized-fibre drain and sewer pipe.

Wilbur S. Holton

Mr. Holton joined Orangeburg in 1929 as a member of the company's underfloor duct sales division. He was appointed Eastern district sales representative for the company in 1939, and was named assistant general sales manager in January, 1950.

R. E. Hodges, manager of the **Appalachian Electric Power Company's** Charleston, W. Va., division, has been promoted to assistant general manager of the company at Roanoke, according to a recent announcement by **G. L. Furr**, Appalachian vice-president and general manager.

Joe P. Gills, district manager at Logan, W. Va., has been named to succeed Mr. Hodges at Charleston. **Miller C. Porterfield**, assistant manager of the Welch, W. Va., district has replaced Mr. Gills at Logan.

Mr. Hodges, immediate past president of the Public Utilities Association of the Virginias, is a native of Alderson, W. Va., and has been with Appalachian and affiliated companies since his graduation from West Virginia University in 1926. He joined AEPCO at Sprigg, W. Va., and in 1927 was transferred to the Ken-

put YOUR CUSTOMERS (and yourself) in the Best Light

Light & Power fluorescent and slimline fixtures give your customers the best light at reasonable cost. Quality construction, easy maintenance, and efficient operation are backed by L & P's famous FULL GUARANTEE.

For all these reasons, L & P fixtures put *you* in the very best light, too—with your customers. They like you, trust you . . . come back again and again for the repeat business that rings sweet music in your cash register.

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Distributed by Wholesale Dealers Only
1035 Firestone Blvd., Memphis, Tenn.

LIGHT & POWER UTILITIES CORP. L&P

tucky and West Virginia Power Company. In 1940, he became assistant general manager of that company and in 1943 was made general manager. He was named to the Charleston post in 1948.

Mr. Gills has been with Appalachian 19 years. A native of Marion, Va., he started work with the company at Pulaski following graduation from Virginia Polytechnic Institute in 1934. When the company formed its Abingdon district in 1948 he was named manager. He has been Logan district manager for the past year.

Mr. Porterfield has been assistant district manager at Welch since 1950. Before that he was superintendent in the Pulaski district. Also a VPI graduate, he has worked in Bluefield and Pulaski.

George Hart has joined **Bentley and Co.**, Chicago advertising agency, as account executive specializing in electrical, electronic, instrument and

George Hart

control accounts. Mr. Hart was managing editor of *Electric Light and Power*, and then became research director for the Haywood Publishing Company.

Eugene L. Hough, chief engineer, **Union Electric Company of Missouri**, has been elected vice-president and reappointed chief engineer, a position he has held since 1951.

Before joining Union Electric in 1928 as an electrical engineer, Mr. Hough, a 1922 graduate of the University of North Dakota, spent six years with General Electric Co. He was appointed chief design engineer in 1943 and since becoming chief engineer has been in charge of all the company's engineering and construction work.

James O. Johnson has been named general sales manager of **Buchanan Electrical Products Corp.**, Hillside, N. J., according to recent announcement made by **Arthur G. Prangley**, corporation president.

Mr. Johnson is, in his new capacity, in complete charge of both internal

PRICING ERRORS
OUT-OF-DATE PRICES
DELAYED QUOTATIONS
COST YOU
MONEY
CUSTOMERS
TIME

YOUR BEST SOLUTION IS TO ORDER TSP TODAY!

THE ELECTRICAL WHOLESALE PRICE BOOK SERVICE PUBLISHED BY TRADE SERVICE PUBLICATIONS, INC.

HERE'S PROOF!

HERES WHAT TYPICAL DISTRIBUTORS SAY ABOUT T S P:

"—serving our customers better, in the field, at the counter, and on the phone, since we installed T S P price book service."— B. F. Buchan, Southern States Supply Co., Charlotte, N. C.

"T S P service assures us that our branches have up-to-date prices."—J. A. Meier, Florida Electric Supply Co., Tampa, Florida.

"We find T S P service invaluable for our salesman and throughout our organization."—J. E. Thompson, Thompson-Wilson Co., Atlanta, Georgia.

You, too, can get the benefit of our 20 years experience. Distributors from coast to coast rely on T S P for latest up-to-date price information. This detailed price information service is designed especially for your operation as an electrical wholesaler. It is supplied in loose leaf form and kept up to date with latest revised price sheets mailed weekly. Net prices are calculated to save you time and are tailored to your own individual location. This saves you time and avoids errors. The basic price book is thoroughly cross indexed with specific page numbers given for every manufacturer and item listed in the 2,500 pages.

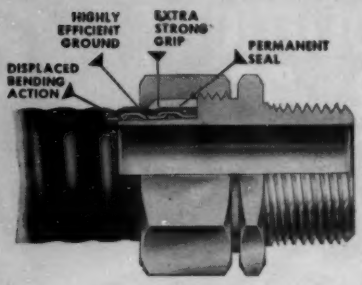
WRITE TODAY FOR FREE DETAILED INFORMATION ON HOW YOU, TOO, CAN BENEFIT BY USING T S P SERVICE!

Trade Service Publications INCORPORATED
673 No. Wells St.
Chicago 10, Ill.

it's new...

an improved connector for liquid-tight flexible conduit

(Sealtite or equivalent products)



PYLE-NATIONAL

"CT" series Connectors offer all these advantages

EXTRA STRONG GRIP
- Compression force applied against body shank—not against the conduit alone, making a vise-like clamp.
- Gripping is well behind end of flexible conduit for firm anchorage.
- Pliable seamless sleeve makes a plastic-to-plastic grip with the conduit sheath ... thereby avoids cutting and abrasion common to metal sleeves.

PERMANENT SEAL
- Plastic Sleeve and Conduit Sheath have equivalent physical characteristics therefore the seal will last the life of the conduit.

HIGHLY EFFICIENT GROUND
- Less than 10 millivolt drop.
- Tapered body shank, makes a firmly wedged contact with the flexible metal conduit.

DISPLACED BENDING ACTION
- Tapered body shank is elongated to extend beyond gland nut, thus avoiding short radius bends which shorten the life of the conduit sheath and the permanency of the joint.

"CT" series connectors can be installed assembled. Available in Straight, 45° and 90° types for ⅜" to 2" conduit. Meet U/L and J.I.C. standards.

SINCE 1897

THE PYLE-NATIONAL CO.
1354 North Kostner Avenue
Chicago 51, Illinois

and external sales operations and all phases of advertising, publicity, and sales promotion on the company's products which now include "pres-SURE-connectors" for electrical wiring, "Bushend" Insulated Conduit Bushings, "Heavy Duty" Molded Terminal Blocks, and other specialized electrical fittings.

Mr. Johnson, who holds an E.E. Degree from Rensselaer Polytechnic

James O. Johnson

Institute, first became associated with Buchanan in 1946 in capacity of assistant general manager.

Prior to coming with Buchanan, he was successively associated with the U. S. Navy Department, Electrical Materials Laboratory, Brooklyn, N. Y. as assistant to the chief electrical engineer; with Industrial Manufacturers, Inc., Elizabeth, N. J. as chief engineer; and with Aircraft-Marine Products, Inc., Harrisburg, Pa., as chief product engineer.

Two members of the **Oklahoma Gas and Electric Company** moved into higher managerial positions March 1 upon the retirement of **E. B. Smith**, Enid, manager of the com-

E. B. Smith

pany's Northern division, **Donald S. Kennedy**, OG&E president has announced.

Mr. Smith, who has reached the company's compulsory retirement age, was succeeded by **L. A. Wiedman**, former manager of the Norman district. In his new capacity Mr. Wiedman will supervise OG&E operations in 43 northern Oklahoma towns from his division headquarters in Enid.

Mr. Wiedman was succeeded as district manager by **J. L. Farmer**, former street lighting engineer for the company's general office.

Mr. Smith, who retired from active service with the company March 1, has completed nearly 40 years in the electric utility industry. His first managerial position came in 1923 when he was made manager of the company's Central division with

L. A. Wiedman

headquarters in Sapulpa. He remained in this position for 18 years, before being transferred to Enid as Northern division manager in June, 1941.

Mr. Wiedman, who is a veteran of World War I, joined the OG&E in April 1920 at Sapulpa, working as a salesman in the appliance department. During the next six years he

J. L. Farmer

worked as a salesman in Fort Smith, Muskogee and Poteau, and in 1927 was named local manager at Norman. In 1936 the Norman district was organized, embracing the various towns surrounding Norman, and Mr. Wiedman was named manager of the district.

Mr. Farmer, a World War II and Korean veteran, joined the OG&E as a laborer in the construction depart-

ment in June, 1937, after graduating from Oklahoma University, and spent his first two years following construction jobs. He was then transferred to the Arkansas division to do special engineering work.

Mr. Farmer is a registered professional engineer and a member of the American Institute of Electrical Engineers and an associate member of the Oklahoma Society of Professional Engineers. He is presently serving as secretary-treasurer of the Engineers Club of Oklahoma City.

Progress Manufacturing Co., Philadelphia, Pa., has announced the election of **David Lane** as executive vice-

David Lane

president and **Edward K. Raker** as vice-president in charge of sales.

Mr. Lane came to Progress in 1946 as works manager after 11 years with the Edward G. Budd Mfg. Co., and

Edward K. Raker

over 20 years with Heintz Mfg. Co. He was elected vice-president in charge of production at Progress in January, 1948.

Mr. Raker trained for advertising and merchandising at Philadelphia's Temple University. He was with Al Paul Lefton Advertising Agency, Philadelphia, for six years. This was followed by 10 years as advertising and sales manager for Fogel Refrigerator Co. Mr. Raker left Fogel in 1946 to become advertising and sales manager for Progress.

Cope

CABLE TROUGH

Cope Cable Trough being installed at the Etiwanda Steam Station—Southern California Edison Company.

EASY TO INSTALL
EASY TO MAINTAIN

Cope Cable Trough through its simplicity of design and its ease of installation is fast becoming one of the most popular methods of supporting power and control cables in generating stations & industrial plants.

Cope Cable Trough is furnished in completely fabricated sections, with a wide range of standard fittings (tees, elbows and dropouts) which can be easily laid out on drawings and quickly and economically assembled at the job site conforming to almost any requirement.

Write today for further information—Ask for Bulletin **4S.**

You know Cope by these products

Cope

T. J. COPE, INC.

711 SOUTH 50th ST. • PHILADELPHIA 43, PA.

Southern Representatives

Amarillo, Tex.—*Western Light and Supply Company, 75 N. Hughes St.*
Atlanta, Ga.—*The Gearhart Co., P.O. Box 85, North Side Station*
Charlotte 1, N. C.—*Glen & Larson, 123 Brevard Court*
Dallas, Tex.—*I. E. Cope & Co., 1411 Fidelity Union Life Bldg.*
Houston 2, Tex.—*I. E. Cope & Co., 2009 Fannin St.*
Jackson, Miss.—*Gregory-Salisbury & Co., 514 Court St.*
Jacksonville, Fla.—*The Gearhart Co., P.O. Box 5761*
Little Rock, Ark.—*Gregory-Salisbury & Co., 400 Shall St.*
Memphis 12, Tenn.—*Gregory-Salisbury & Co., 2523 Broad Ave.*
New Orleans, La.—*Gregory-Salisbury & Co., 820 Julia St.*
Birmingham, Ala.—*The Gearhart Co., 1727 6th Ave.*

Verall Moe, vice-president of Thomas Industries, recently announced the appointment of **R. W. Minett, Jr.,** as sales manager of the **Moe Light Division of Thomas Industries.**

R. W. Minett, Jr.

Prior to this appointment, Mr. Minett held the position of sales promotion and advertising manager with the Moe Light organization. Mr. Minett has had an extensive background in the lighting fixture industry on the manufacturer, distributor and dealer levels. Before joining the executive staff of Moe Light, he was associated for six years with the Moe Brothers Northern Co., of Appleton, Wis., an independent electrical distributor, serving as vice-president and sales manager.

L. A. Shaw has been appointed manager of the Rocky Mount, N. C., branch of the **Graybar Electric Co.,** Southeastern district manager **L. G. Field** has announced.

Mr. Shaw has been with Graybar for 26 years. He joined the company at Richmond in January, 1928, as a warehouseman, and the next year became office salesman. In August, 1931, he was transferred to Roanoke, and in March, 1932, he became operating manager at Charlotte, N. C., and in April, 1934, operating manager at Durham, N. C. Since February, 1935, he has been salesman successively at Durham, Fayetteville, and Rocky Mount, N. C. He is an engineering graduate of Virginia Polytechnic Institute and served in World War II as a Major.

The appointment of **H. T. White** as district manager for the states of Kansas, Missouri, Arkansas, and portions of Illinois, Kentucky, and Nebraska was announced recently by **F. W. Wehrheim,** vice-president in charge of sales for **Appleton Electric Co.,** Chicago.

Mr. White started out with General Electric, worked there in various capacities including sales, transferred to the G. E. Supply Company as supply sales manager, then joined Appleton in 1938.

He formerly managed the Electrical Contractors Association of Kansas City, Mo., and now carries memberships in the Electric Association of Kansas City, Petroleum Electric Supply Association, and the Illuminating Engineering Society. He is especially qualified in lighting installations, having done specialized work in that field for many years.

Mr. White will be assisted in his new duties by **F. S. Donahue** and **M. E. Hamilton.**

James E. McComack, well known in Southeastern electrical circles for more than a quarter-century, has become Southeastern engineering and sales department representative for the **Perfeclite Co.,** Cleveland, Ohio, with headquarters at 129 Interlochen Dr., N.W., Atlanta, Ga. He will cover the states of Georgia, Alabama, Florida, North Carolina, South Carolina, Virginia and Tennessee, including Memphis.

Mr. McComack's work is intended to supplement the work of W. J. Milner & Co. of Atlanta and Lewis E. Crews of Richmond who are the Perfeclite Company's sales representatives.

Mr. McComack has a broad background of experience in the lighting field. Prior to joining Perfeclite, he was connected with Edison Lamp Works, which later became the Incandescent Lamp Department of General Electric Co., Noma Electric Corp., and more recently with the Noland Co., headquartering in Atlanta. He is a charter member and past officer of the Georgia Section, Illuminating Engineering Society, and is also a member of the Atlanta Residence Lighting Forum's executive committee.

James E. McComack

Sam Rutledge has been named to succeed **Roy Bell** as manager of the **Graybar Electric Co.,** branch at Amarillo, Texas. Mr. Bell has been transferred to the Abilene branch

Latrobe PRODUCTS

FLOOR BOXES • WIRING SPECIALTIES

The ease and speed with which "Latrobe" Products are installed cut time and labor costs substantially. The same directness of design that makes for these fast installations also helps assure smooth, trouble-free service.

Floor Boxes • Cover Plates • Pipe or Conduit Hangers • Gang Boxes • Nozzles • Fish Wire • Cable Supports • Junction Boxes • Insulator Supports • Staples and Cable Clips

Represented in the South by

FULWILER & CHAPMAN, INC.
702 Whitehall St., S.W., Atlanta, Ga.
213 S. Front St., New Orleans 12, La.
445 English St., Greensboro, N. C.

LEIGH A. DOXSEE CO.
4030 Chouteau Ave., St. Louis 10, Mo.

FRED H. SIMMER CO.
1406 S. Akard St., Dallas 1, Texas

FULLMAN MANUFACTURING CO.
LATROBE . . . PENNSYLVANIA

pending his retirement a year from now. Mr. Rutledge is former operations manager of the Amarillo branch.

Mr. Bell, a senior electrical equipment sales representative in the Southwest territory, opened the Graybar branch warehouse in Amarillo in 1946.

Richard F. Baldini has been appointed by the **Economy Fuse and Manufacturing Co.**, Chicago, as their representative in the states of Louisi-

Richard F. Baldini

ana and Mississippi. Mr. Baldini has an extensive background in the electrical field and will make his headquarters at 2718 Castiglione St., New Orleans 19, La.

Charles L. Woodyard, of 161 Simpson St., N. W., Atlanta, Ga. has been appointed agent for the **Miller Company**, Meriden, Conn., as representative for the state of Georgia, trading areas of Birmingham, Montgomery and Dothan, Ala., and those counties in South Carolina within the Au-

C. L. Woodyard **H. B. Connell**

gusta and Savannah trading areas.

Mr. Woodyard replaces **Howard B. Connell**, former representative, who has been promoted to the position of sales promotion manager in the general offices of The Miller Company, in Meriden.

W. B. Shenk has been promoted to director of commercial and industrial development for **Florida Power**

"Our Sales For 1953 Were Far Beyond Anything We Had Anticipated"

THURMAN-LOGAN ELECTRIC SUPPLY CO., INC.

Distributors of *Electrical Supplies*

1401 Chestnut Street • Chattanooga 2, Tennessee • Phone 7-5514

February 12, 1954

Cavalier Corporation
Chattanooga, Tennessee

Gentlemen:

In September 1952 we opened for the first time, the door of this company for business.

One of the first items placed in our new warehouse was a stock of Cavalier Electric Heaters.

Our sales for the balance of 1952 were very gratifying. After looking over our 1953 records, we find that our sales of Cavalier Electric Heaters for 1953 were far beyond anything we had anticipated.

We are proud to be a Cavalier Distributor and find it one of our most profitable lines.

Sincerely,

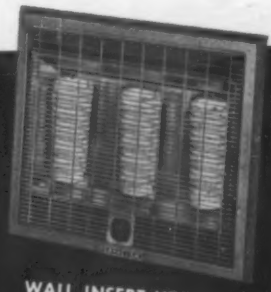
R. W. Thurman

R. W. Thurman
THURMAN-LOGAN ELECTRIC SUPPLY CO.

Cavalier®

AUTOMATIC ELECTRIC HEATERS

COMPLETE LINE:
Wall Insert, Surface Mounted, Portable, Full Chrome Finish Wall Insert, and Non-automatic Bathroom Heaters, and Floor Furnaces.



WALL INSERT HEATER

WRITE FOR DESCRIPTIVE LITERATURE
and Guide for Calculations of Electric Space Heating

CAVALIER CORPORATION
Electric Heater Division
CHATTANOOGA 2, TENNESSEE

Corp., J Shirley Gracy, vice-president in charge of sales, has announced. Mr. Shenk previously was director of the commercial development department.

A veteran of 29 years in the electric industry, Mr. Shenk first joined

W. B. Shenk

Florida Power in 1930 as commercial engineer. In 1932, he transferred to the Virginia Public Service Co., and served as commercial sales manager until 1944. Returning to FPC, he first was assistant new business manager and since 1945 has been director of the commercial development department.

Paul M. Hooven has been named to head a new marketing region recently formed by **General Electric's air conditioning division,** according to **Jack S. Beldon,** manager of marketing of the division at Bloomfield, N. J.

Mr. Hooven will be located in At-

Paul M. Hooven

lanta, headquarters of the Southeastern region, which includes states from Maryland through Florida.

With G-E since 1938, Mr. Hooven has served the air conditioning division as sales representative to government agencies in World War II and the Korean War. He has spent the last two years as home heating and cooling sales representative in the Maryland and Virginia territory.

Charles L. Stroup, who has been chief engineer for **Hubbard and Co.,** has been made vice-president in charge of research. His headquarters will continue to be at the Chicago plant, where he has been since join-

Charles L. Stroup

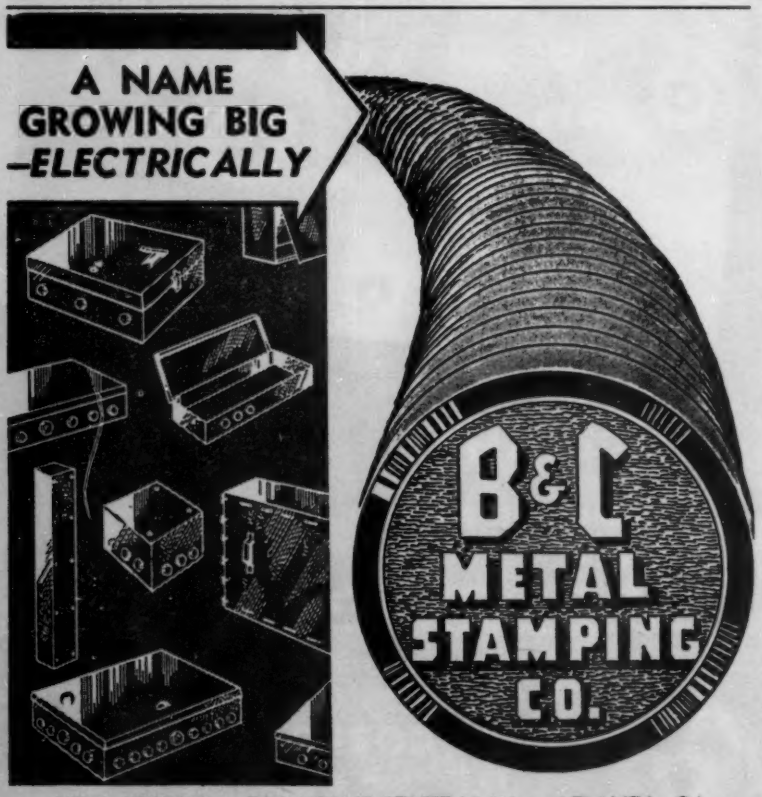
ing the company. Mr. Stroup's experience in the electrical industry is widely diversified. A graduate of Louisiana State University, he worked for a large power company and later for an insulator manufacturer before coming to Hubbard in 1940.

A. H. Bruning has been named a vice-president of **Georgia Power and Light Co.,** with headquarters in Valdosta, **John W. Lastinger,** president of the utility, has announced. Mr. Bruning, former director of industrial development for Florida Power

A. H. Bruning

Corp., will handle industrial development for GP&LC, which is a wholly-owned subsidiary of Florida Power.

A veteran of 26 years in the electric industry, Mr. Bruning is an electrical engineering graduate of Stevens Institute of Technology, Hoboken, N. J. He served seven years with General Electric's lamp development department after grad-



NEW ADDRESS – 590 MEANS STREET N. W. – ATLANTA, GA.

uation, then for 10 years he was with the Dallas Power and Light Co., and South Carolina Gas and Electric Co.

In 1937, he joined Florida Power and served as commercial manager until called to active duty with the U. S. Corps of Engineers. He was a major when relieved from active duty in 1946. He returned to FPC as assistant director of the industrial development department and was promoted to director in 1950.

Pass & Seymour, Inc., Syracuse, N. Y. announce the appointment of **Raymond K. Watkins** to the position of sales manager.

Mr. Watkins comes to Pass & Seymour from Yale & Towne Manu-

Raymond K. Watkins

facturing Co., where he was trade sales manager. He succeeds **C. L. Nicholson, II,** who has been forced to discontinue his activity as sales manager due to poor health. Mr. Nicholson will, however, continue to serve in a consulting capacity to the extent his health permits.

Wynne Snoots Co., manufacturers' representatives of Dallas, Texas, has announced the appointment of **Charles E. Whitlock** as district represen-

Charles E. Whitlock

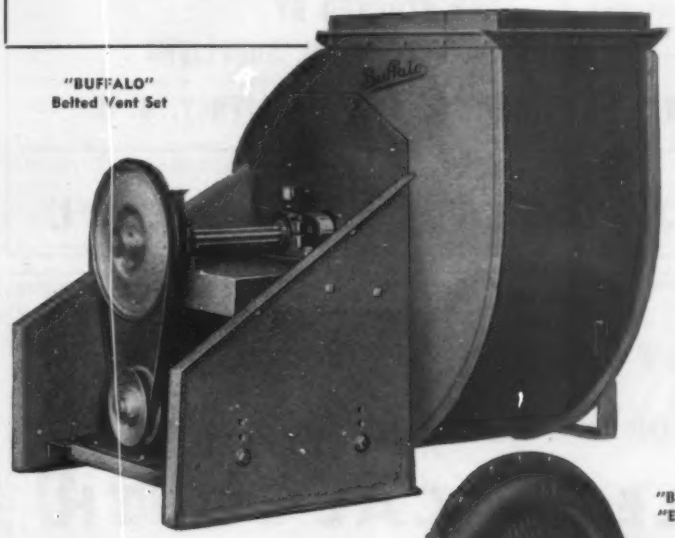
tative for the states of Oklahoma and Arkansas. He succeeds Elmer Prag, who resigned recently. Mr. Whitlock will maintain offices in Tulsa.

Mr. Whitlock, an engineering

SELL THE FANS THAT HAVE BEEN PLEASING CUSTOMERS for *77 Years*

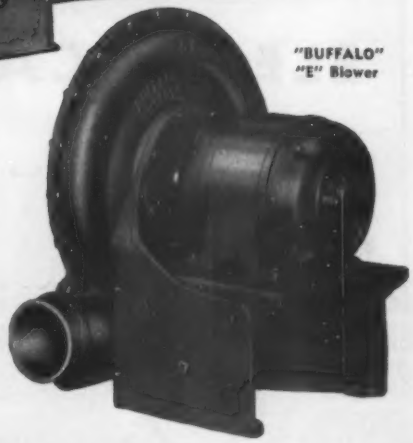
Since 1877, the name "Buffalo" has stood for good, dependable equipment. Today, you can offer a modern, high-efficiency "Buffalo" Fan for almost any air handling job your customers could call for — from kitchen and attic fans to large ventilation fans and exhausters. Below are two "Buffalo" Fans popular for their easy installation, high delivery and low maintenance costs.

"BUFFALO" Belted Vent Set



"Buffalo" Belted Vent Sets are lightweight, non-overloading package units for quiet ventilation. Removable motor sheaves permit changing capacity any time. 500 to 20,000 cfm capacities. Write for Bulletin 3720.

"BUFFALO" "E" Blower



At right, "Buffalo" "E" Blowers — Exhausters are husky units for blowing small furnaces and forges, cleaning operations, cupola work. Write for Bulletin 3014-C.

BUFFALO FORGE COMPANY

"Buffalo"

210 Mortimer St. Buffalo, N. Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

Ventilating Air Cleaning Air Tempering Induced Draft Exhausting
Forced Draft Cooling Heating Pressure Blowing

NOB-STAPLES

EMT-CONDUIT and SERVICE CABLE STRAPS

STANDARD TO THE ELECTRICAL TRADESMEN AND STOCKED BY ALL LEADING ELECTRICAL SUPPLIERS

W. W. CROSS & CO., INC. — JAFFREY, N. H.

GENERAL SALES AGENTS

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graduate of St. Joseph's College, Muskogee, Okla., has been employed as city supply salesman for Graybar Electric Co., Tulsa, for the past six years. The Snoots company's lines include the Edwards Company, Revere Electric Mfg. Co., Wiremold Company, and Walker Brothers.

Progress Manufacturing Co., Philadelphia, Pa., announces the appointment of **Herman R. Lindell** as its representative for the Mid-South territory including the states of Alabama, Arkansas, Louisiana, Mississippi, Tennessee and the city of Pensacola, Florida, succeeding **Will Turner**, who requested a reduction in his large territory.

Herman R. Lindell

Mr. Lindell comes to Progress with long experience in the lighting fixture industry. He will make his headquarters at 2108-5th St., S. Birmingham, Ala.

Benjamin Electric Manufacturing Co., Des Plaines, Ill., has announced the appointment of **A. A. Michel** to head their Nashville territory, and the addition of **R. H. Hiller** to their Atlanta office.

A. A. Michel

Mr. Michel has been associated with the lighting industry for many years, having previously been with the Goodrich Electric Co., and Appleton Electric prior to joining Benjamin in August, 1953.

Mr. Hiller was formerly district

representative in Atlanta for Curtis Lighting. He is an electrical engineering graduate of Iowa State College, and has taken an active

R. H. Hiller

interest in all phases of lighting activity. He has been active in the Illuminating Engineering Society since 1947.

J. R. Richards, president, the **J. R. Richards Co.,** Carnegie, Pa., has announced the appointment of **Gayle Lewis,** formerly company sales manager, as vice-president in charge of marketing. **George W. McCall, Jr.,** has been appointed sales manager to succeed Mr. Lewis.

Mr. Richards also announced the appointment of the **M. B. Squires Co.,** with offices in the Grant Building, Pittsburgh, Pa., as sales representatives for the company's line of switch and outlet boxes and covers, conduit fittings and electrical specialities in western Pennsylvania, West Virginia, and a part of Ohio. The M. B. Squires Co., was established in 1950 and is headed by **Jack Squires** and **Jack Squires, Jr.**

O. George Lewis has recently joined the Atlanta office of **Anaconda Wire & Cable Co.,** in the capacity of sales engineer, according to announcement by Malcom Black, manager of the Atlanta district office.

Mr. Lewis is a native of Louisiana and was formerly connected with the Engineering Department of the Louisiana Power & Light Co.

R. E. Mullis, 4215 York Road, Charlotte, N. C., has been named by **Ramset Fasteners Division of Olin Industries, Inc.,** as district sales manager for North Carolina, South Carolina and Tennessee, according to **Clarke Tryon,** Ramset manager of sales.

Mr. Mullis formerly had been sales manager for Southern States Supply Co., Inc., of Charlotte.

James B. Richardson, with headquarters in Columbia, S. C., has been appointed by **Anderson Brass Works, Inc.,** Birmingham, Ala., to handle

James B. Richardson

their full line of distributor products in North and South Carolina.

Mr. Richardson, a graduate of the University of Florida, has spent all his business life in the Southeast. For the past four years he has represented several manufacturers out of his own office in Columbia.

nothing succeeds like ... Quality

PLYMOUTH TAPES

SOLD ONLY THROUGH RECOGNIZED WHOLESALERS

The World's Largest Selling FRICTION TAPE • The World's Finest PLASTIC ELECTRICAL TAPE

PLYMOUTH RUBBER COMPANY, INC.

Since 1896

CANTON, MASSACHUSETTS

New products

Pocket size tester

THREE NEW high-voltage models have just been added to the Amprobe Junior line of pocket volt-amp testers by the Pyramid Instrument Corporation, Lynbrook, N. Y.

Each comes with two voltage ranges: 0-150/600 volts a-c and is

available in an ammeter range of either 0-25, 0-50 or 0-100 amps a-c. These three new models are especially designed to fill the needs of the plant maintenance man, plant electrician and industrial contractor.

For electricians, contractors and service men who work mostly with 110 volt and 220 volt lines, the Amprobe Junior is also available in 0-125/150 volt models, in current ranges of either 0-10, 0-25 amperes, 0-50 or 0-100.

The Amprobe Junior does all the work of a voltage tester, with instrument accuracy on a calibrated scale, and also gives an instant current reading without the need of shutting down equipment.

New 54-inch fans

TWO NEW GIANT, one horse power, 54-inch fans, delivering 25,000 C.F.M. have just been put into production by the Phil Rich Fan Mfg. Co., of Houston, Texas. One is a wall exhaust fan, for vertical use, the other is an attic fan, designed for either vertical or horizontal use.

Finished in an attractive hammertone gray, both of these highly efficient fans have streamlined venturi frames for silent operation. They are rubber mounted, have sealed-for-life SKF ball-bearings, and are powered by heavy-duty G-E motors. The fans have heavy welded construction throughout, but for their size are amazingly easy to install.

Increased production, not only of the two new 54-inch fans, but in

their entire commercial and industrial line, has necessitated another plant expansion for the Phil Rich Co. Located in their own large offices and plant at 2900 Caroline, Houston, the Rich Company has taken over a 10,000 square foot building directly across the street.

Cable puller

A NEW POWER TOOL for conduit jobs is available to electrical contractors and maintenance men in the newly developed and patented Barth "Powered" cable puller, manufactured by the Barth Corp., 12650 Brookpark Road, Cleveland 29, Ohio.

The machine is portable and can

be operated in any position for either pushing or pulling purposes. It pushes 25 feet of fish tape per minute around five 90° bends, stopping automatically if conduit is obstructed, or it pulls 15 feet of wire per minute into ¾-inch to 2-inch conduit. The machine provides 175

feet of .060-inch x ¼-inch usable tape. It operates on 115 Volt AC or DC current and pulls 1200 pounds dead weight, equivalent to the pulling power of eight men. The machine is attached to the conduit by means of brackets; supports hold the machine in either vertical, horizontal or angle positions and there is no strain on box or wall. The machine weighs 65 pounds.

Gym lighting fixtures

A NEW LINE of lighting fixtures for gymnasiums, auditoriums, drill halls and other high bay areas, is now being offered by Steber Manufacturing Co., Broadview, Illinois.

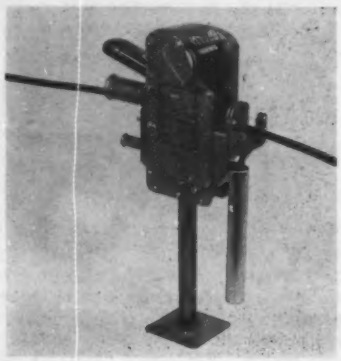
One of these is the pendant type which is available in two sizes, one for R-40, the other for R-52 projector flood lamps, 150 to 750 watts. Similar units can also be had for flush or surface mounting. All types are equipped with sturdy hinged cast aluminum louvered guards. Snap-in type rubber-roller latch simplifies opening and closing the guard during relamping operation which is accomplished from the floor through the use of vacuum or clamp type lamp changer.

Complete descriptive bulletin—No. 137-53—is available upon request to manufacturer.

Wire, cordage meter

OLYMPIC INSTRUMENT Laboratories, Dept. BD, Cove, Wash., have announced their No. 600 lineal measuring device for wire, cordage, TV ribbon, etc. This instrument affords rapid and accurate measurement and is designed for merchandising, industrial and laboratory service.

Interchangeable guide tubes permit capacity ranging from nylon fishing leader to one-inch diameter flexible electric cable or cordage. Veeder-Root counter indicates "feet" and "inches" to 9,999 feet. The mechanism requires no lubrication and an integral wax scraper cleans meter wheel, assuring accuracy.



Also available is a cutter and complete line of reeling equipment. This meter conforms to the requirements of the National Bureau of Standards Committee on Specifications and Tolerances.

Remote-control wire

ANNOUNCEMENT of a new Flamenol indoor remote-control wire has been made by the Wire and Cable Department of General Electric's Construction Materials Division, Bridgeport 2, Conn.

The new wire now offers visual circuit identification, color-coded the same as the leads on G-E remote-control devices. It has a twisted construction for easier stripping and faster installation and prices for this new wire will be lower than for the older remote-control wire which was of flat parallel construction.

The new remote-control wire is designed for indoor use on low-voltage remote-control wiring systems, low-voltage thermostatic control circuits, and bell wiring. It is available in two- and three-conductor construction and has a rating of 30-volts maximum. Color-coding for the two-conductor wire is black and white; for the three-conductor wire,

DIXISTEEL
TRADE MARK
HOT-DIP GALVANIZED
GROUND RODS
5/8" X 8'
The finishing touch to a first-class job
THE MARK of a good electrical job well done is a DIXISTEEL Galvanized Ground Rod.
Sharp-pointed for easy driving . . . hot-dip galvanized for positive protection against rust. 5/8" x 8' and other popular sizes carried in stock.
Write or telephone for prices.
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MAKERS OF DIXISTEEL
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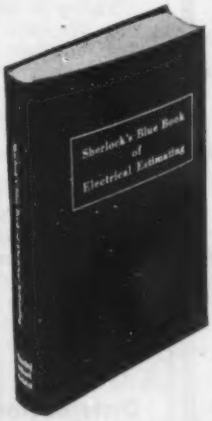

BRAND NEW—
QUICK ANSWER
ELECTRICAL
ESTIMATING GUIDE
Covers Over 2000 Wiring Jobs
This new, entirely different estimating guide has 175 completely worked out charts.
Authentic, Time Saving—
Easy to Use
This book is easy to use—it has no complicated mathematics or formulas to work over. You merely determine the nature of the wiring, check it in the BLUE BOOK OF ELECTRICAL ESTIMATING and there's your answer—it's the simplest estimating book ever written.
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This book was written by a successful electrical contractor and estimating engineer with over 20 years' experience. It has an entirely different method of determining estimates on wiring jobs. Electrical contractors, journeymen, architects, and engineers will find use for this book every day. Gives time required to do jobs along with complete labor charges in every state in the country. Order this book now from your supplier at special introductory price of $7.75, or send coupon below.
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Send me the NEW BLUE BOOK OF ELECTRICAL ESTIMATING. I understand I may return the book within 5 days for complete refund if not 100% satisfactory.
NAME
ADDRESS
TOWN ZONE STATE
☐ I enclose $7.75.
☐ Send C.O.D. I'll pay postman $7.75 plus C.O.D. fee on delivery.
Apr. ES-2

SPERO "LARGE AREA" FLOODLIGHTS

OPEN AND ENCLOSED WEATHERPROOF TYPES WITH RANGE OF QUALITY AND BEAM SPREADS TO COVER ANY FLOOD-LIGHTING NEED.

SERIES A
750-1500W

Latest in design to meet the most exacting lighting requirements. A variety of beam spreads for all applications.

SERIES Y
750-1500W

A low cost unit to meet minimum standards. Highly efficient and with a wide angle distribution to fit any need.

Both units available in Slip Fitter, Wall, Pipe and Cross Arm mountings

SPERO also makes "GUARANTEED" PORCELAIN ENAMEL REFLECTORS... FLOODLIGHTS... VAPOR-TIGHT UNITS... INSULATORS... SWITCHPLATES

THE SPERO ELECTRIC CORPORATION
20500 St. Clair • Cleveland 17, Ohio

There's Money To be Made By Selling ATLANTIC to the Trade

#901
Non Metallic Connector

#523
Entrance Cap

ACF

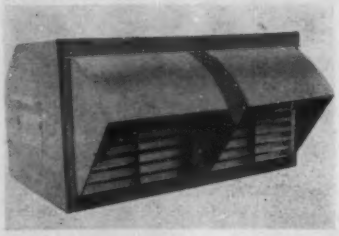
ATLANTIC CONDUIT FITTINGS CO.
BOSTON, MASS.

black, white and red. Individual conductors are of 7-strand copper wire for flexibility and are No. 20 Awg in size. Catalog Number of the new wire is SI-53087.

Home, industrial fans

VALLEY FAN Manufacturing Co., Fort Valley, Ga., has announced their complete line of fans for home and industrial use, and wall and ceiling shutters for 1954.

Feature of the new line is the company's industrial, heavy-duty Penthouse fan units. These units are available in both single and twin penthouses and are constructed of



heavy-gauge galvanized steel, completely weatherproofed. They are equipped with automatic shutters and have a CFM range up to 50,000. Fans and penthouses are shipped completely assembled with minimum installation required.

Valley is offering window fans in 24-, 30-, and 36-inch sizes. These fans are belt driven and equipped with two-speed motors with fixed mounting panels. These fans are ultra-quiet, have a CFM range of 4,300 to 10,600, and are beautifully finished in gray hammertone.

Valley attic fans are available in sizes from 24 through 42 inches and come in both horizontal and vertical discharge types. CFM ranges for the attic fan line are 6,900 through 16,500. The company's attic fan line is featuring a new Economy model.

Complete literature and prices are available from the company.

Distribution transformer

WITH THE RISING popularity of air conditioning, power companies are finding need in many of their residential areas to supply some three-phase power in addition to single phase. One way of doing this economically is from a distribution transformer with two dissimilar windings in one tank.

CSP duplex transformers are now being made for this purpose by the Westinghouse Electric Corporation. They can be built for different combinations of ratings, but a common one is 25-kva single-phase, and 5-kva single-phase, which can be connected in open delta to supply 8.66 kva 3 phase and 25 kva single phase or any limited combinations of these.

The windings are different in size, in keeping with the different load requirements, and are arranged for open-star primary connection and open-delta secondary. A fortunate feature of the three-phase bimetal actuated breaker that became available about a year ago is that the bimetals can be connected in the two windings in such a way as to give full protection for both single phase and three phase and for any combination of the two loads.

Wiring gas stations

(*Continued from page* 43)

applicable requirements set up for Class I Installations in Article 500 for Hazardous Locations. These requirements are covered by Sections 5011 to 5026, inclusive.

Special considerations

The balance of the electrical equipment and wiring shown to be outside of the hazardous areas in the above diagrams, may have to be given some special consideration even though it is not directly within these hazardous locations. Some of the wiring and equipment may be installed by any of the standard acceptable requirements set forth in the general wiring rules of Chapters 3 and 4 of the National Electrical Code.

However, some of the equipment and wiring, while entirely outside of the hazardous areas, may be so located or so installed as to contribute to possible hazardous conditions. For example, the left hand lighting standard has its lamps entirely outside of the hazardous areas and so does the right hand lamp standard. Under certain conditions, however, it is possible for the hot metal particles from those in the right hand standard to fall into the hazardous area below. Therefore, suitable guards or screens may be required to prevent the escape of these hot metal particles. Section 5105f1 provides for such installations if the equipment is 12 feet or less above the floor level.

For all possible conditions which may require special consideration for the wiring and equipment above the hazardous areas in "gasoline dispensing and service stations," the requirements of the aforementioned Section 5105 apply. Specifically 5105e covers the "Wiring in Spaces Above Hazardous Areas" and 5105f covers the "Equipment above Hazardous Areas."

A-W promotions

(*Continued from page* 58)

electrical contractor's name. These signs and the houses are floodlighted for night showings.

Evaluation of promotions

What have been the results of our participation in home shows?

As you all know, it is very difficult to evaluate accurately the results of adequate wiring promotions. It will probably be several years before we will begin to see any tangible results of the work we have done last year or even the work done the preceding three or four years, but we can make some conclusions from the records of our adequate wiring activity. Generally our local adequate wiring activity has shown a steady increase since 1950 in all phases with number of layouts for last year increasing 9.1 per cent over 1952, number of houses certified increasing 17.7 per cent over 1952, and the number of outlets added increasing 21.7 per cent over 1952. But the item that has increased the most on the jobs that we know about is the item of individual equipment circuits.

By comparing our 1950 record with 1953 we find that individual equipment circuits have increased 55 per cent during this period. This certainly indicates that more people are planning ahead for the use of electric appliances than did a few years ago. I must caution you here by telling you that we do not have as large an AW program as some other companies so these percentages do not mean that we are setting the world on fire as you might gather at first impression. But, what these figures do mean is that we are making steady progress and we believe that quite a bit of this progress is the result of our home show promotions.

Good fan year

(*Continued from page* 41)

able, and they want relief from it. Therefore, the demand for fans follows, in direct ratio, the mercury reading throughout the summer months. And the size of the demand is affected not only by the temperature, but also by the strength of the promotion of summer heat relief.

In order to share in fan sales profits, the dealer must have his promotion ready to launch on the crest of the summer's heat waves, basing his promotion on the benefits of fan ownership discussed above. An effective fan sales promotion program which can easily be worked into the regular sales scheme could include: a fan display in the show window; a store demonstration point showing the actual unit displayed for inspection; counter literature to be given away; placards on trucks announcing where to get the fans; newspaper ads with dealer mats and electros which are usually provided by the manufacturer; radio and TV spot announcements; direct mail, including enclosures in regular mailing pieces; and personal solicitation.

Choose your market

Direct mail and personal solicitation are especially valuable in the promotion of attic fans. These techniques should be directed to the upper and middle income groups and especially to old customers in these brackets. Personal solicitation works well in reaching

MASSEY
WIRING
DEVICES

DEPENDABLE *in use*
PROFITABLE *to sell*

Duplex Receptacles

Standard No. 100

With Plaster Ears No. 100P

- Listed by Underwriters' Labs. CSA App. No. 3141
- Individually boxed.
- 5/8" steel screws supplied for installation.
- Rated: 10 amp. 250 V., 15 amp. 125 V.
- Brown and Ivory.

Duplex Receptacle T Slot with Plaster Ears

No. 105

- Listed by Underwriters' Lab., Inc.
- Meets REA Specs.
- Meets Fed. Specs. W-R-151-a.
- Four No. 8-32 screws backed out for attaching wires.
- Individually boxed including 5/8" steel screws for installation.
- Rated: 10 amp. 250 V., 15 amp. 125 V.
- Brown and Ivory.

Write for Complete Catalog

Do you have our complete catalog? Send for a copy today.

A. H. MASSEY, INC.
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Single and Multi-Gang Wall Plates and Electric Wiring Devices Since 1936

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the commercial market for window fans, since there are a large number of prospects concentrated in small areas, and once you sell to two or three shopkeepers in a shopping center, many others will buy to keep up with their competitors.

Many dealers have found it profitable to return to a house or store about a week after they have made an installation of an attic or window fan, on the premise of checking the fan's operation. Often the satisfied customer will furnish promising leads of neighbors, relatives, or friends who have seen this fan in operation and have expressed interest in owning one for themselves. Following up leads of this sort has turned summer fan sales into a lucrative business for many a dealer.

In addition to concentrated selling and promotion effort during the summer months when consumer demand is high, the dealer should make a point of planning a year-'round promotion with builders and architects in connection with the attic and built-in kitchen fan. Encouraging builders and architects to specify attic and kitchen fans at the blueprint stage may help to get a large-scale fan business going. Enclosing manufacturer's sales literature in regular mailings to builders is one way to keep them mindful of the advantages of built-in ventilating equipment.

Taking a cue from the near-sellout 1953 season, the electrical dealer can expect big things from fan sales this summer. Hundreds of thousands of fans will be bought this summer, and promotion is all that is needed to bring the customers to the dealer's doors during the next few months.

Wiring for research

(*Continued from page* 38)

Under-voltage or loss of voltage on the main feeder supply bus will automatically trip the emergency bus tie breaker and close the emergency tie breaker.

When the emergency loads are energized from the emergency supply, restoration to normal can be accomplished at the remote control station located in the substation. This is a manual operation and can be effected only if the main breaker is closed and voltage has been restored to the main feeder supply bus. Operation of the main breaker is independent of the transfer scheme and therefore allows restoration of power to the main feeder supply bus while at the same time the emergency bus is being supplied from the emergency source.

If a long outage on the normal supply should occur, it would be possible to supply power from the 5,000-kva emergency turbo-generator to the normal supply feeders of the various power centers. Essential and necessary loads could be fed independently from this supply. If there were a complete loss of power to both normal and emergency sources, emergency loads could be supplied by the 5,000-kva turbo-generator output by closing the emergency bus-tie breaker.

The animals and dog kennels building has a total floor area of 185,355 square feet and will house the many varied animals used in medical research.

The power supply for this building will be fed by three separate three-phase feeders from the substation. These feeders will be used for expansion to other buildings until there is a need for additional substation feeders.

The building load will be handled by a 1,500-kva power center consisting of three 500-kva network transformers and their associated network protectors, low voltage switchgear, and interconnecting metal enclosed bus.

Features of distribution

Continuity of service is assured throughout the entire system by the use of segmented-bus construction with tie breakers, network protectors, and air circuit breakers with their associated controls. If a fault should occur in any 13.2-kv primary distribution cable, it will be isolated by operation of overcurrent relays in the substation and reverse power relays at the distribution load centers. Since two or more primary distribution cables feed each power center, the isolation of one primary cable for maintenance and repair does not affect service continuity.

LIGHTING FIXTURES

Sta-Brite Fluorescent Mfg. Co., P. O. Box 6352, Miami, Florida has added a complete line of contemporary lighting fixtures, Hi Hats, Bullets, recessed, etc. in addition to their extensive line of Fluorescent and Slimline Fixtures. Catalog on request.

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3544	25 ft.	16/2 16/3SJ
3545	50 ft.	16/2 16/3SJ
3546	25 ft.	16/2 26/3SJ
3547	50 ft.	16/2 26/3SJ
3548	100 ft.	16/2 26/3SJ

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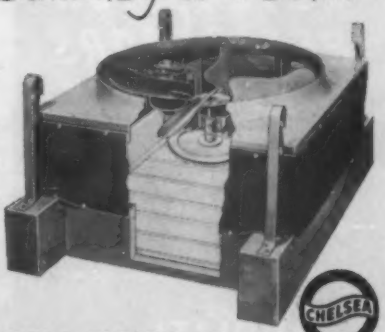

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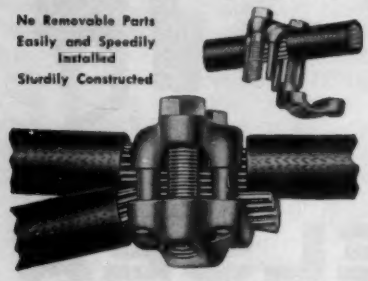

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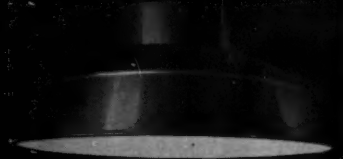

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THE JONES METAL PRODUCTS CO.
WEST LAFAYETTE, OHIO

Secondary loads are not affected by the loss or outage of one transformer since the installed transformer capacity in each power center is sufficient to handle load when one primary feeder or transformer is out of service. This is assured by solidly bussing the load side of the protectors supplying power to the low-voltage switchgear through a single main breaker. When the load feeder breakers are subjected to short circuit currents above their interrupting ability, they cascade on the main breaker.

The installation of low-impedance busway for distribution to heavy load areas, such as wire closets and elevator switchboards, assure ease of relocation and expansion with a minimum of time and material scrappage. By using busway as the distribution arteries for these heavier loads, savings in initial installation space was also realized.

Provision for expansion

Space for installation of future feeder breakers is provided in each low-voltage switchboard. This will make the adding of additional feeders relatively simple and will eliminate power outages during installation.

The very nature of the spot network system assures flexibility. Changing load conditions are easily adaptable to this system since the power centers are located in carefully selected areas. Transformer capacity for additional load growth has been provided in each area, making necessary only the addition of feeders when load is added.

Good voltage regulation is assured since the primary distribution voltage is brought near the load areas, thereby keeping the secondary low-voltage feeder runs as short as possible. Better voltage regulation on the heavier loaded circuits is also insured by the use of low-impedance busway connecting the distribution points to the power centers.

Maintenance aids

Ease of operation and maintenance was also of prime importance in the selection of the electrical system. Again the network system and its associated equipment is designed to fulfill this need. Both the high-voltage and the low-voltage switchgear assemblies are of the dead-front-type construction with mechanically-interlocking devices that trip the breakers when the doors are opened. During repair or maintenance on any breaker a duplicate breaker can be used if continuity of service is required.

The high-voltage air circuit breakers are so designed that when they are cranked out horizontally to the test position they are automatically disconnected and the current-carrying parts grounded. However, by pushing the secondary contacts forward, the control circuit can be energized and the breaker checked for operation. In addition, it can be rolled to the test panel and connected for complete electrical test by means of the test cable and contact block.

The low-voltage air circuit breakers are also of the horizontal drawout type.

The network protectors and their associated relays can be easily inspected, tested, and maintained by opening the protector cover and swinging the hinged panel out. The protector can be completely disconnected and rolled out on extension rails by removing the fuses, disconnecting the load links, and unfastening the hold-in nuts.

The electrical system was designed by the Electrical Section of the supervising architect office, Public Buildings Services of the General Services Administration. The general contractor is John McShain, Inc. The electrical installation was made by the Joint Adventurers (Harry Alexander, Inc.; Howard P. Foley Co., Inc.), a three-firm contracting group.

Economic comments

(*Continued from page 5*)

nation. Some employment drop was expected to a certain extent. January is a poor month upon which to base economic prediction even insofar as labor and employment are concerned. Yet this year's figures certainly tend to illustrate the strength of the South's new economic machine and the optimism of its business leadership.

Undoubtedly it augurs well for the balance of 1954 and might serve to indicate that this area is not ready to talk of recessions or depressions as yet. Perhaps it is because the Southern states have so much to do to fulfill their aims and aspirations for a strong and virile economy.

Or perhaps it is because our business leaders are content to stick to the job and continue progress or production growth. Either way it is a sign of economic health and one which can be a leading factor in the growth of our resources and living standards.

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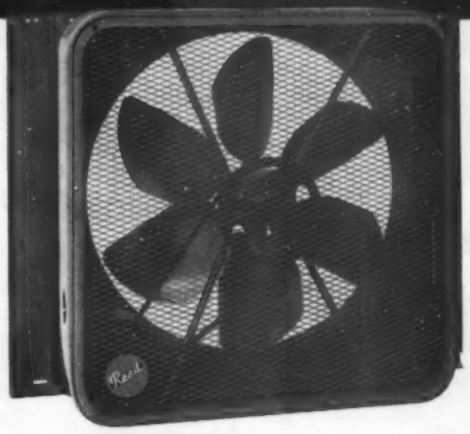

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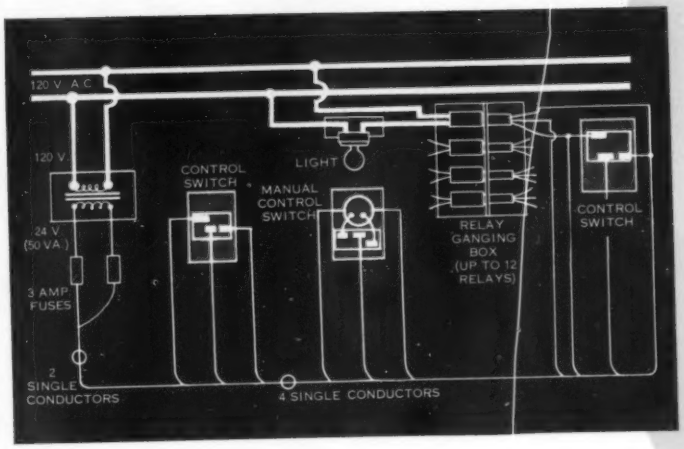
Wiremold Company, The ..... *
Wood & Anderson Co. 93
Woodyard, Charles L. 74
Wright, Earl E. ..... *

Y

Young Engine Corporation ..... *
Youngstown Sheet & Tube 2

The Swing is to
LOW VOLTAGE CONTROL

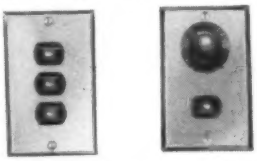
. . . and you'll prefer SQUARE D for a lot of reasons



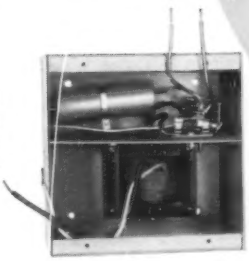
Here is a low voltage remote control system with all the features you've wanted . . .

Because it saves so much installation time, the cost of this very flexible system compares favorably with conventional systems. Actually less, in many cases. It offers a super-convenient means of switching lighting and appliance circuits. It has scores of applications—in homes, office buildings, schools, churches, warehouses, factories.

Relays are extremely rugged 20 amperes, 120 volts A C Also 20 amperes, 277 volts A C for low voltage control of high voltage fluorescent lighting. All relays mount in ½" knockouts.



Control Switches are toggle type and fit Despard plates and straps. One, two, or three control switches (*left, above*) or one **Manual Selector Switch** and one control switch (*right, above*) can be mounted on a single strap. Manual selector switch controls from 1 to 9 circuits. Key-operated switch also available.



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Relay Ganging Box for speedy, convenient and quiet installations.

Master Controller automatically controls up to 23 individual circuits from any location.

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Address Square D Company, 6060 Rivard Street, Detroit 11, Michigan.

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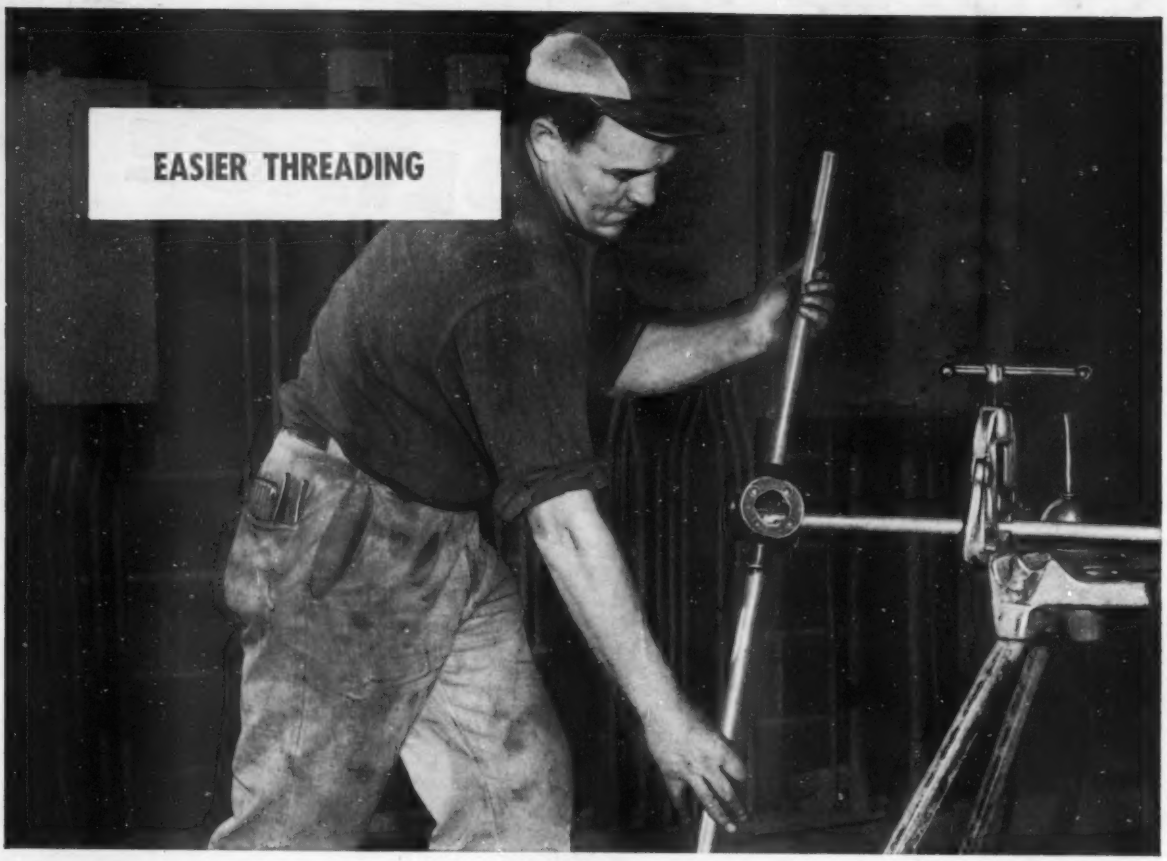

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